



**Alaska  
Fisheries Science  
Center**

National Marine  
Fisheries Service

U.S. DEPARTMENT OF COMMERCE

## **AFSC PROCESSED REPORT 98-03**

# **1994 Bottom Trawl Survey of the Eastern Bering Sea Continental Shelf**

March 1998

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1994 BOTTOM TRAWL SURVEY OF THE EASTERN BERING SEA  
CONTINENTAL SHELF

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## ABSTRACT

The Resource Assessment and Conservation Engineering Division of the Alaska Fisheries Science Center conducts annual bottom trawl surveys to monitor the condition of the demersal fish and crab stocks of the eastern Bering Sea continental shelf. The standard study area, surveyed each year since 1979, encompasses a major portion of the eastern Bering Sea shelf between the 20-m and the 200-m isobaths and from the Alaska Peninsula north to approximately the latitude of St. Matthew Island (lat. 60° 50' N). In 1994, this area was again surveyed by two chartered trawlers, the 40 m F/V Arcturus and the 40 m F/V Aldebaran.

Demersal populations were sampled by trawling for 30 minutes at stations centered in 20 x 20 nautical mile grids covering the survey area. At each station, species composition of the catch was determined and commercially important species were sampled to obtain length distributions and age structure samples.

Survey results presented in this report include relative fishing powers of the survey vessels, abundance estimates for fish and invertebrates, geographic distributions of important fish species, size composition of principal fish species, and age and growth information for selected species. Surface and bottom temperatures recorded at each sampling station are also presented.

Appendices provide station data, species listings, and detailed results of analyses of abundance and biological data of the sampled populations.

## INTRODUCTION

The eastern Bering Sea continental shelf supports one of the most productive groundfish fisheries in the world (Bakkala 1988). Since 1970, annual commercial catches of groundfish have ranged from 1.2 to 2.2 million metric tons (t) (North Pacific Fishery Management Council 1990). Although many species are caught commercially, the most abundant has been walleye pollock (*Theragra chalcogramma*), which, since 1970, has comprised more than 70% of the total landings. The next most abundant species have been yellowfin sole (*Pleuronectes asper*) and Pacific cod (*Gadus macrocephalus*) which have comprised 8% and 5%, respectively, of the commercial landings.

Since 1971, the Resource Assessment and Conservation Engineering (RACE) Division of the Alaska Fisheries Science Center (AFSC) has conducted annual bottom trawl surveys of the eastern Bering Sea continental shelf. In 1975, the first large-scale survey of the eastern Bering Sea shelf was conducted under contract from the Bureau of Land Management in response to a need for baseline data to assess the potential impact of proposed offshore oil exploration and development on fishery resources (Pereyra et al. 1976). During this baseline survey, sampling was conducted over the eastern Bering Sea shelf between the 20 m and 200 m isobaths and from the Alaska Peninsula north to approximately 62°N latitude. In subsequent years, the areal coverage of the annual surveys was reduced, until 1979 when the most comprehensive survey of the Bering Sea shelf was undertaken in cooperation with the Japan Fisheries Agency (Bakkala and Wakabayashi 1985). The 1979 survey encompassed the entire region sampled in the 1975 baseline study, and in addition, the continental slope waters between the Aleutian Islands and the U.S.-U.S.S.R. convention line, and the shelf region between St. Matthew and St. Lawrence

Islands. A hydroacoustic survey was also conducted in 1979 to assess the midwater component of the walleye pollock population. Subsequent annual bottom trawl surveys have essentially resampled the stations established during the 1975 survey, with slight modifications each year. This region encompasses the major portion of economically important eastern Bering Sea groundfish populations, except those primarily located in continental slope waters. Every third year (1979, 1982, 1985, 1988, 1991) an extended survey has been conducted, including hydroacoustic assessment of midwater pollock, bottom trawl sampling of the continental slope, and bottom trawl sampling in the region between St. Matthew and St. Lawrence Islands. Although the hydroacoustic survey and a few stations north of the standard area were completed in 1994, no survey was done on the continental slope. The information gathered by the annual surveys serves to: 1) provide the North Pacific Fishery Management Council with annual fishery-independent estimates of abundance and biological condition of commercially exploited stocks, 2) provide distribution and abundance information to commercial fishermen, and 3) develop a time-series database contributing to our understanding of the population dynamics and interactions of groundfish species.

This report presents information collected by the AFSC in the eastern Bering Sea during the 1994 bottom trawl survey. The groundfish/crab survey and several ancillary projects were conducted from 31 May to 4 August by two U.S. vessels. Detailed information on principal crab species can be found in a report by Stevens et al. (1994).

## METHODS

### Survey Area and Sampling Design

The standard station pattern for the eastern Bering Sea survey is based on a systematic 20 x 20 nautical mile grid. In areas surrounding St. Matthew and the Pribilof Islands, grid block corners were also sampled to better assess blue king crab (Paralithodes platypus) concentrations. The survey design pattern called for 356 stations. In 1994, 355 standard stations and 28 additional stations north-west of the standard pattern were successfully sampled (Fig. 1 and Appendix A).

Starting with the eastern stations, the two vessels fished alternate north/south lines of stations such that coverage of the survey area was similar for each vessel. This sampling design facilitated the computation of relative fishing powers (or catch efficiencies) of the two vessels. The progression from east to west was established to prevent multiple encounters of yellowfin sole, Alaska plaice (Pleuronectes quadrituberculatus), and perhaps other species which may be migrating eastward during the course of the survey (Smith and Bakkala 1982). Tows were usually 30 minutes in duration and fishing was limited to daylight hours. For data analysis, the survey region was divided into six subareas bounded by the 50 m, 100 m, and 200 m isobaths and by a line separating the northwest and southeast portions of the study area (Fig. 1). This stratification scheme was designed to reduce the variances of population and biomass estimates by conforming to oceanographic domains which seem related to distributions of Bering Sea fishes (Bakkala 1988). The presence of high-density sampling for blue king crab in subareas 3, 4, and 6 necessitated a further division of these subareas into high-density and standard-density



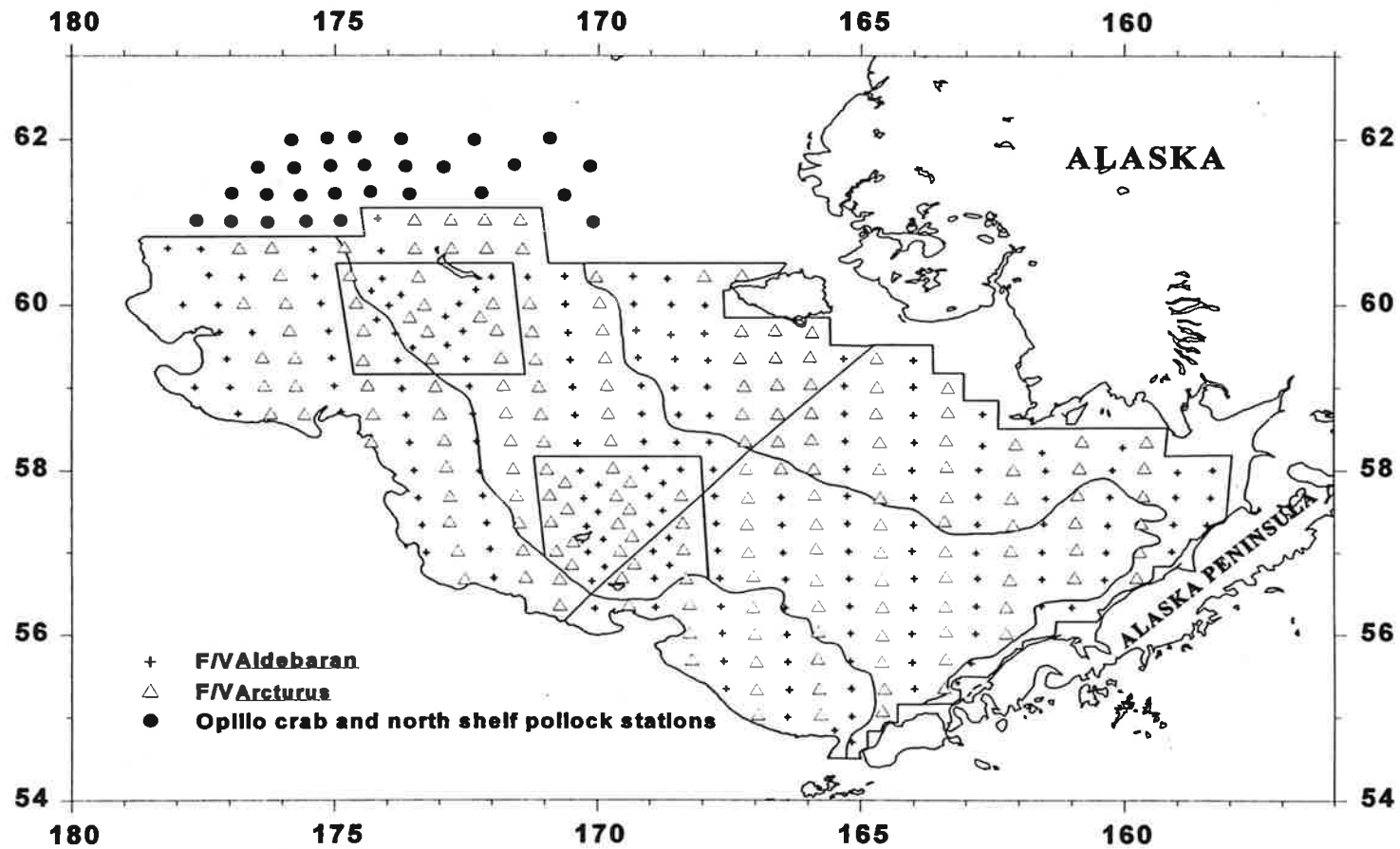


Figure 1.--Standard and special study stations sampled during the 1994 eastern Bering Sea bottom trawl survey, and stratifications used for the analysis of data.

sample strata, resulting in a total of 10 geographic strata. The overall sampling density for the entire survey area was one station per 1,305 km<sup>2</sup> (Table 1). However, because of the high-density sampling in subareas 3, 4, and 6, and the irregular subarea boundaries, sampling density among the six subareas varied from one station per 1,123 km<sup>2</sup> to one per 1,552 km<sup>2</sup>.

Table 1.--Size of subareas and sampling densities by subarea for the 1994 eastern Bering Sea bottom trawl survey (see also Fig. 1).

Subarea	Area (km <sup>2</sup> )	No. Stations successfully sampled	Sampling density (km <sup>2</sup> /stn)
1 (10)	77,871	58	1,343
2 (20)	41,027	31	1,323
3	103,300	77	1,342
(31)	94,526	69	1,370
(32)	8,774	8	1,097
4	107,822	96	1,123
(41)	62,703	44	1,425
(42)	24,011	31	775
(43)	21,108	21	1,005
5	38,792	26	1,492
6	94,562	67	1,411
(61)	88,134	60	1,469
(62)	6,429	7	918
Subareas combined	463,374	355	1,305

## Vessels and Fishing Gear

The 1994 eastern Bering Sea bottom trawl survey was conducted aboard the 40 m fishing vessels Arcturus and Aldebaran (Table 2). As in previous years, both vessels were equipped with 83-112 eastern otter trawls which have 25.3 m (83 ft) headropes and 34.1 m (112 ft) footropes (Fig. 2). These nets were attached to tail chains with 54.9 m (30 fathoms) paired dandyines. Each lower dandyline had a 0.61 m chain extension connected to the lower wing edge to improve bottom tending characteristics. Steel "V"-doors measuring 1.8 x 2.7 m and weighing 816 kg were used.

Table 2.--Characteristics of vessels used during the 1994 eastern Bering Sea bottom trawl survey.

Vessel	Overall Length (m)	Horsepower	Survey Period	
			Start	Finish
F/V <u>Arcturus</u>	40	1525	31 May	4 August
F/V <u>Aldebaran</u>	40	1525	31 May	2 August

SCANMAR<sup>1</sup> net mensuration systems were used aboard each vessel to measure net height and width. Net width was measured by the distance between two sensors attached to the upper starboard and port dandyines, about 0.61 m in front of the net. Mean net widths were calculated from observations recorded within each tow. These data were then used to establish a net width-scope (wire-out) relationship for each vessel to enable prediction of net width for tows where net width data were not available (Fig. 3) as described by Rose and Walters (1990). Estimates of net width were used in area-swept calculations.

<sup>1</sup> Reference to trade names does not imply endorsement by the National Marine Fisheries Service, NOAA.

83/112 EASTERN

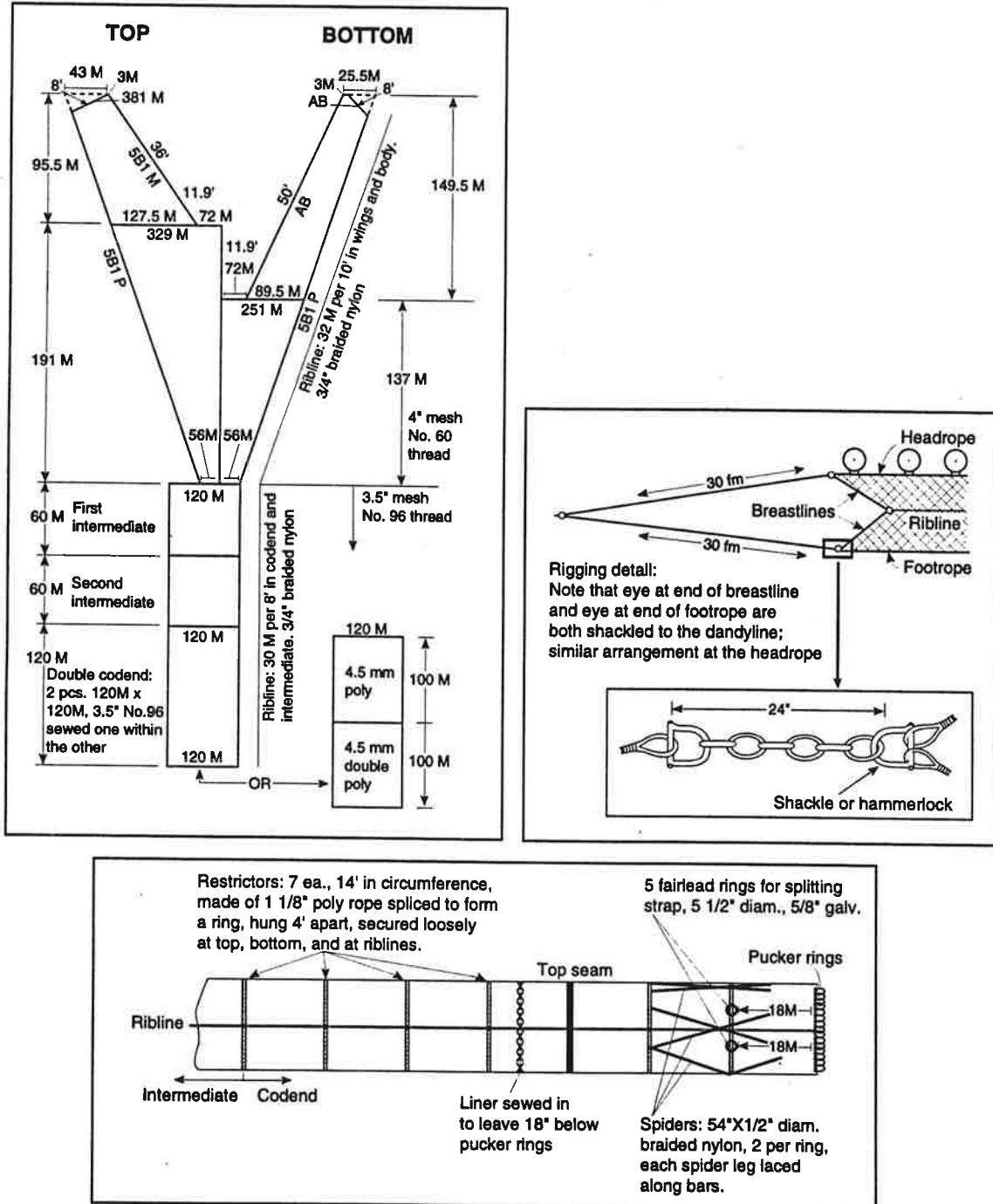


Figure 2.--Schematic diagram of trawl used during the 1994 eastern Bering Sea bottom trawl survey.

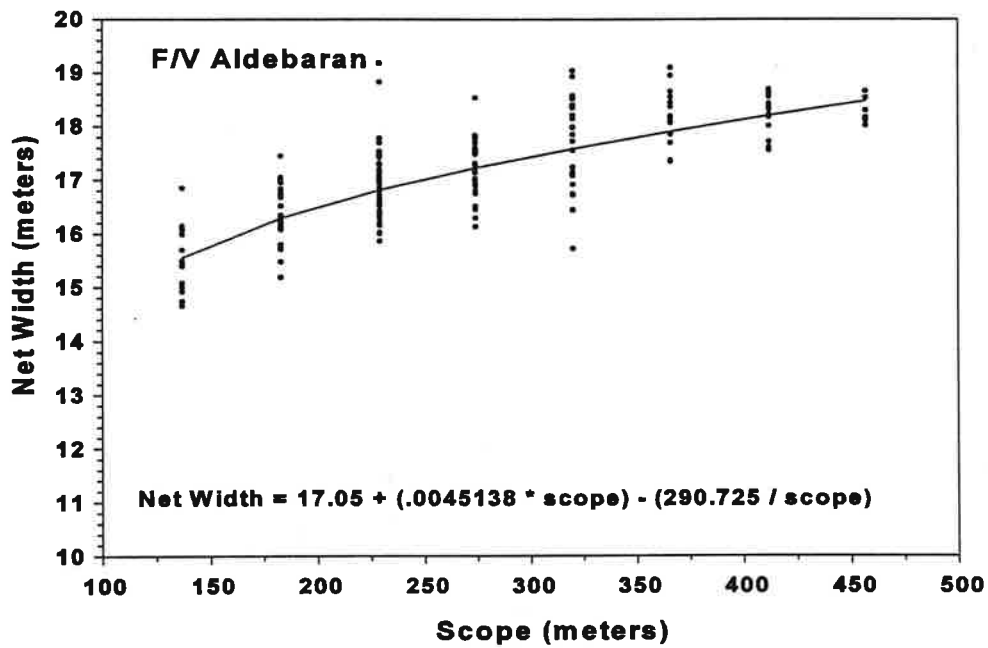
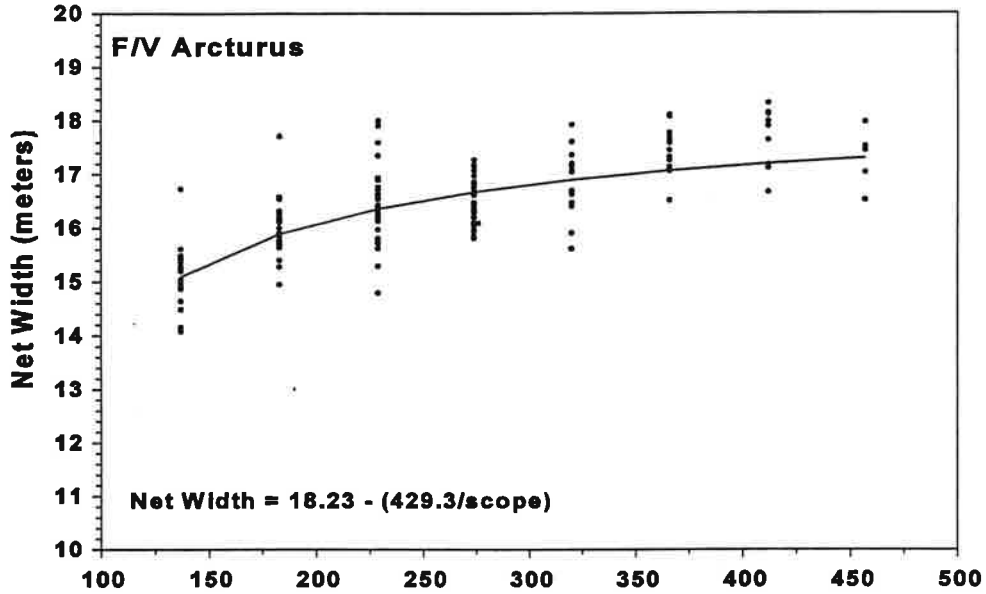


Figure 3.--Relationship between net-width and scope (wire-out) for vessels participating in the 1994 eastern Bering Sea survey.

## Data Collection

Sampling procedures used in RACE eastern Bering Sea assessment surveys are described in detail by Wakabayashi et al. (1985). A brief summary follows.

Samples were collected by trawling at the center of each 20 x 20 nautical mile grid block (or corner station, in the case of high-density strata) for 30 minutes (timed after the net had settled on the bottom), towing at a speed of 1.54 m/sec (3 knots). If the bottom appeared to be untrawlable at the specified location, the nearest trawlable site within the same grid square was used. If the net was ripped or "hung up" on some object on the bottom during the tow, the catch was discarded and a new sample obtained.

Catches of less than approximately 1,150 kg (2,500 lb) were processed entirely while larger catches were subsampled. Economically important fish and invertebrates were sorted to species with the exception of four species of flatfish. Similar features between arrowtooth (*Atheresthes stomias*) and Kamchatka flounder (*Atheresthes evermanni*), and flathead sole (*Hippoglossoides elassodon*) and Bering flounder (*Hippoglossoides robustus*) made identification of these species difficult within the time constraints of the survey; thus, these species were grouped by genus for purposes of this report. Minor species of fish and invertebrates were sorted to the lowest taxonomic level practicable. Catch weights and numbers by species or species group were estimated directly or, when subsampled, estimated by extrapolating the proportion in the subsample to that of the entire catch weight. Pacific halibut (*Hippoglossus stenolepis*) and crab species of the genera *Paralithodes* (red and blue king crabs, *camtschaticus* and *platypus*, respectively), *Chionoecetes* (snow and Tanner crabs, *opilio* and *bairdi*, respectively), and *Erimacrus* (hair crabs, *isenbeckii*) were usually weighed and enumerated from the entire catch.

Size composition data were collected for each commercially important species. Pacific halibut, walleye pollock, Pacific cod, and yellowfin sole were measured whenever caught while other species were measured as time permitted (Table 3). Pacific halibut were measured immediately upon capture and returned to the sea in an effort to reduce sampling mortality for this species. Random samples of the remaining species of up to approximately 200 individuals (300 in the case of walleye pollock) were sexed and measured to the nearest centimeter from the tip of the snout to the end of the middle rays of the caudal fin (fork length).

Sagittal otoliths were collected from nine fish species (Table 4). In both the northwestern and southeastern divisions of the survey area, three otolith pairs per sex/centimeter interval were collected for Pacific cod and rock sole (Pleuronectes bilineatus), and five pairs per sex/centimeter interval for all other species. Scales as well as otoliths were taken from Pacific cod to aid in age determination of young fish. Individual fish weight data were collected for Alaska plaice in conjunction with otolith sampling. In the case of the Hippoglossoides, otoliths were collected only from individuals that were identified with certainty as flathead sole. Age structures for roundfish were preserved in 50% ethanol/water; flatfish otoliths were preserved in 50% glycerol/water.

Temperature profiles were taken at each station using either a micro-bathythermograph (MBT) attached to the head rope of the net or with an expendable bathythermograph cast (XBT); surface temperatures were taken by bucket thermometer.

Table 3.--Number of length measurements taken during the 1994 eastern Bering Sea bottom trawl survey.

Species	Length measurements by subarea						TOTAL
	1	2	3	4	5	6	
walleye pollock	1,895	1,356	8,460	9,207	1,788	11,026	33,732
rock sole sp.	7,282	3,588	7,395	6,558	154	1,723	26,700
yellowfin sole	8,231	4,486	6,629	5,054	13	7	24,420
flathead sole	593	6	4,949	2,407	2,880	5,531	16,366
Pacific cod	2,557	534	1,923	5,039	395	1,914	12,362
Alaska plaice	2,060	1,865	1,430	3,798	1	137	9,291
arrowtooth flounder	38	--	2,082	767	2,335	1,971	7,193
Bering flounder	--	10	--	1,831	--	517	2,358
Pacific halibut	486	131	369	366	69	225	1,646
Kamchatka flounder	--	--	133	50	251	798	1,232
Greenland turbot	--	--	3	26	1	368	398
Pacific herring	89	308	--	--	--	--	397
rex sole	--	--	6	--	192	26	224
Arctic cod	--	--	--	51	--	--	51
starry flounder	29	--	--	--	--	--	29
Sakhalin sole	--	--	--	11	--	--	11
chum salmon	--	2	4	--	4	1	11
northern rockfish	--	--	--	--	6	--	6
Pacific ocean perch	--	--	--	--	3	--	3
rougheye rockfish	--	--	--	--	2	--	2
butter sole	1	--	--	--	--	--	1



Table 4.--Number of fish from which age structures were collected, by species and subarea, during the 1994 eastern Bering Sea bottom trawl survey.

Species	Subarea						TOTAL
	1	2	3	4	5	6	
walleye pollock	81	0	448	242	94	231	1,156 <sup>a</sup>
Pacific cod <sup>b</sup>	173	21	190	260	26	29	760 <sup>a</sup>
yellowfin sole	167	173	115	71	0	0	526
rock sole sp.	160	0	124	84	0	99	467
Alaska plaice	167	18	0	43	0	0	228
flathead sole	0	0	91	0	67	216	374
Kamchatka flounder	0	0	40	0	50	53	143
arrowtooth flounder	0	0	42	0	0	83	125
Greenland turbot	0	0	0	13	0	93	197 <sup>a</sup>

<sup>a</sup>Some age structures were collected outside the standard survey area, therefore, the numbers collected for the six subarea do not add to the total.

<sup>b</sup>Scales were also taken.

## Data Analysis

A brief description of the procedures used in the analysis of RACE Bering Sea survey data follows (for a detailed description see Wakabayashi et al. 1985). Some of the species collected were grouped by family for data analysis because of their insignificant commercial value or questionable identification.

Relative fishing powers between the two vessels were determined using the methods of Kappenman (1992). Three-hundred twenty-five stations sampled by the two vessels during the standard survey (Fig. 1) plus 19 stations from special studies were used in that analysis (see Appendix A).

Mean catch per unit effort (CPUE) values for each species were calculated in kilograms per hectare and number per hectare for each of the 10 strata; area swept (hectares) was computed as the distance towed multiplied by the mean net width (Alverson and Pereyra 1969). Mean CPUE values, weighted by strata areas, were calculated for individual subareas and for the overall survey area. Biomass and population estimates were derived for each stratum by multiplying the stratum mean CPUE by the stratum area. Stratum totals were then added together to produce estimates for each subarea and for the total survey area.

In estimating the size composition of populations of principal commercial species, length-frequency data obtained at each station were expanded to the station catch by proportion and then extrapolated to the stratum population by the weighted CPUE. Stratum estimates were summed to derive the estimated size composition by subarea and for the overall survey area.

Otolith and scale samples collected during the survey were read by the Age and Growth Determination Unit of the AFSC's Resource Ecology and Fisheries Management (REFM)

Division. From these age samples, stratified by sex and length, an age-length key was produced that showed the distribution of ages by sex at each centimeter interval. Population age composition was estimated by apportioning ages to the estimated population number at each length interval. Only species whose age samples have been read by the time of writing of this publication have been included in the age analyses. Species completed at a later date will be presented in subsequent publications.

Growth characteristics of principal species were described with von Bertalanffy (1938) growth curves fitted to age-length data collected in this survey.

#### Special Studies

Stomach samples from several of the most prevalent commercial species in each haul were collected and preserved in formalin for later examination by REFM's Food Habits Program (Table 5).

Additional activities included collecting specimens for observer training programs, collecting samples for fish and crab pathology studies (Table 5), and fulfilling collection requests from academic institutions.

At the end of the survey two additional experiments were performed. The F/V Aldebaran fished with a specially designed trawl with a divided codend (trouser trawl) to determine the feasibility of splitting large catches within the trawl rather than in an on-deck splitting bin. The F/V Arcturus performed an experiment to determine the magnitude of herding by the trawl warps on flatfish outside the path of the net but within the distance between the trawl doors. The results of both these experiments will be provided elsewhere.

Table 5.--Biological fish samples collected for special studies during the 1994 eastern Bering Sea bottom trawl survey.

Species	Stomach samples collected	Pathobiological samples collected
Walleye pollock	3,247	24
Pacific cod	2,528	26
Yellowfin sole	815	--
Rock sole	391	--
Flathead sole	557	--
Pacific halibut	290	--
Alaska plaice	262	--
Arrowtooth flounder	505	--
Greenland turbot	94	--
Skates	462	--
Eelpout species	378	--

## RESULTS

### Station Data

Station data from the 1994 survey are listed in Appendix A. Relevant information such as position, tow parameters, time, and environmental measurements are listed for each vessel for all standard bottom trawl stations used in the analyses.

### Environmental Conditions

Sea surface temperatures recorded during the survey ranged from 2.3° to 8.0°C (Fig. 4). As in most previous years, surface temperature increased from east to west across the shelf, probably reflecting the progression of summer warming as the survey proceeded from east to west.

Bottom temperatures ranged from -2.0° to 6.3°C (Fig. 5). The warmest temperatures (above 4°C) occurred in shallow waters along the Alaska mainland, and in the central portion of the inner shelf southeast of Nunivak Island. The coldest bottom temperatures observed were in the northern portion of the mid-shelf at depths between 50 and 100 m.

The mean bottom water temperature for the total survey area in 1994 was 1.8°C (Fig. 6). Historically, this was in the low-range of values recorded for mean summer bottom water temperatures in the standard survey area (annual mean temperatures range from 1.8° to 5.1°C, average of annual means is 2.8°C). Mean bottom temperatures observed over a more limited region of the southeast Bering Sea, which has been sampled annually since 1971, have ranged from 1.2° to 4.8°C; the 1994 value for this area was 2.9°C, just below the long-term average (3.1°C)(Fig. 6).

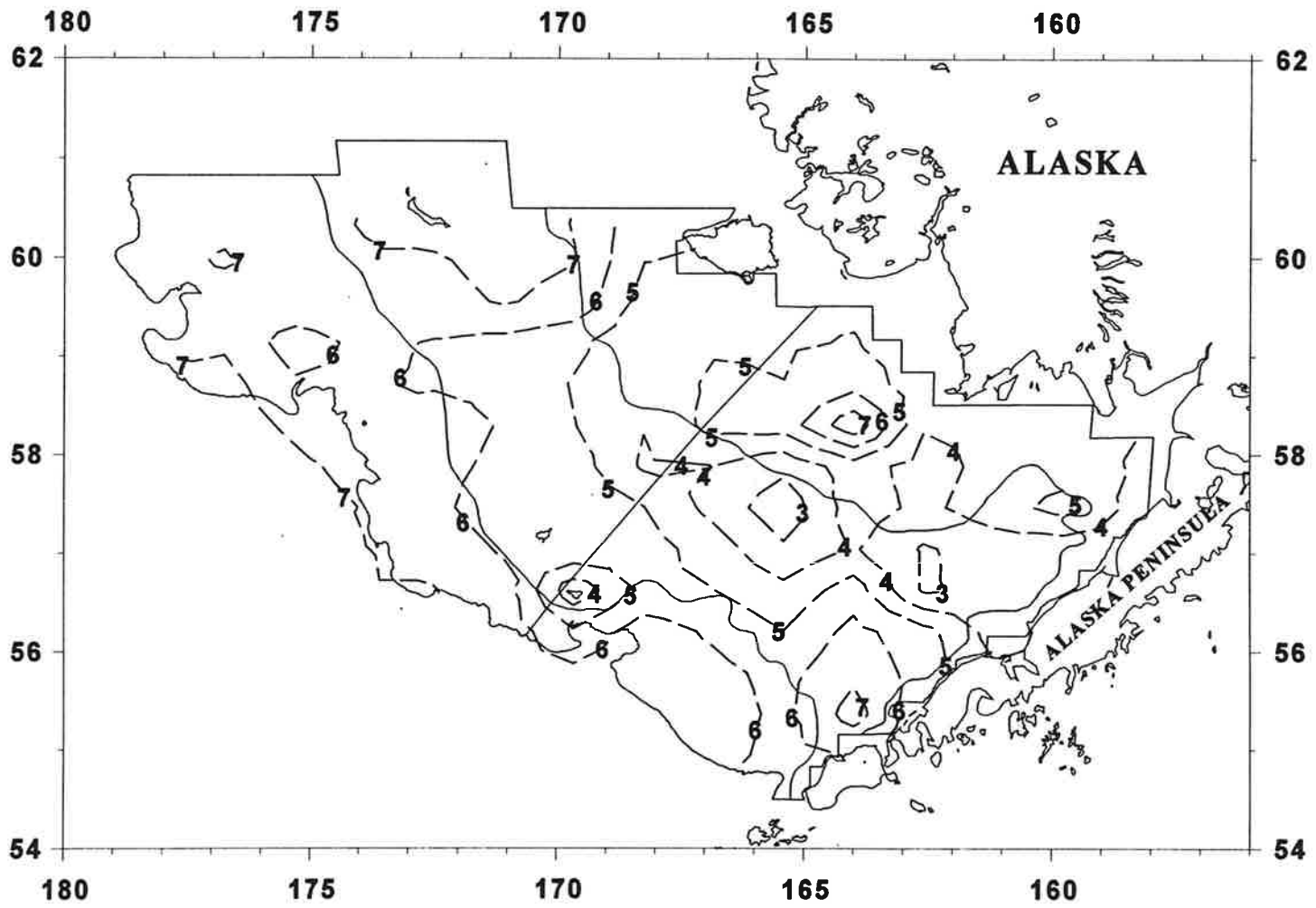


Figure 4.--Distribution of surface water temperatures (°C) observed during the 1994 eastern Bering Sea bottom trawl survey.

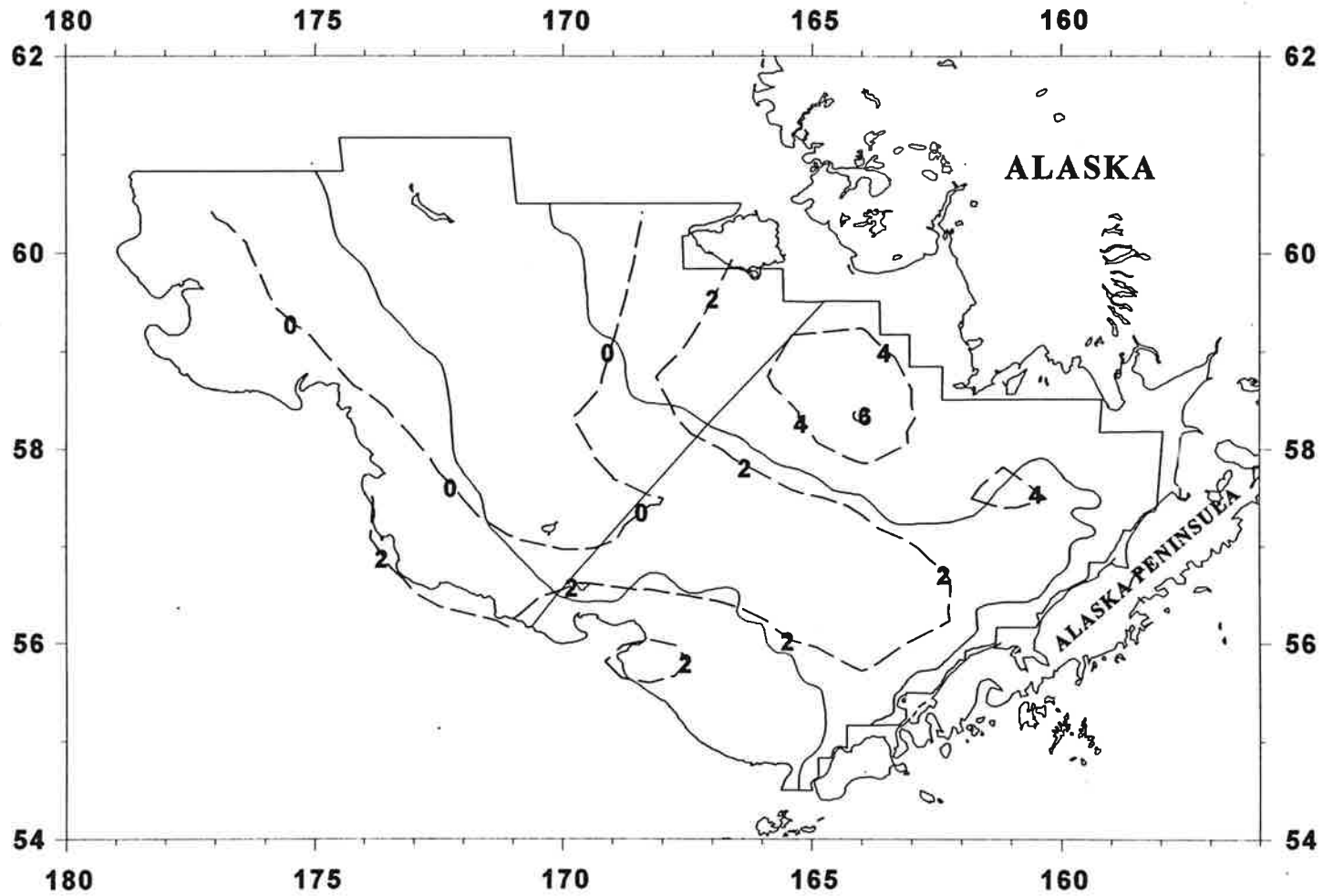


Figure 5.--Distribution of bottom water temperatures (°C) observed during the 1994 eastern Bering Sea bottom trawl survey.

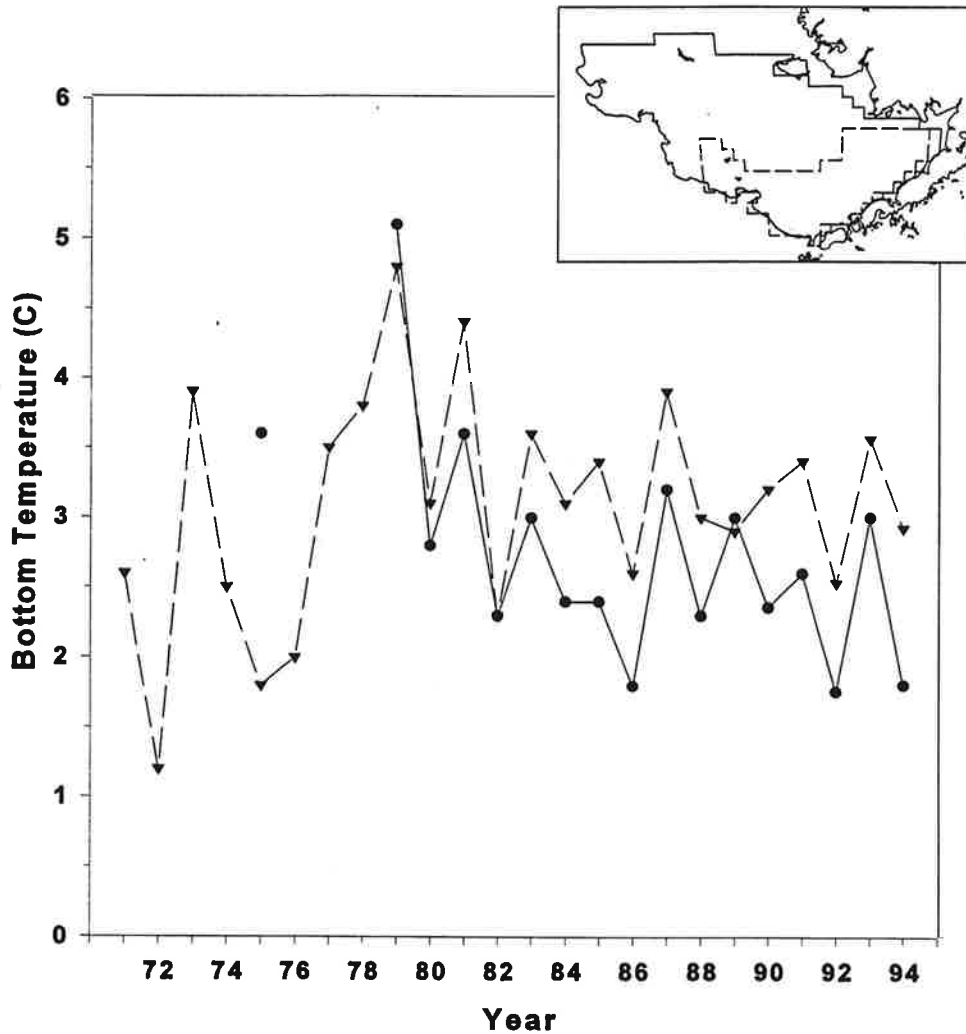


Figure 6.--Mean summer bottom water temperatures based on expendable bathythermograph casts or micro-bathythermographs attached to the net headrope during Alaska Fisheries Science Center bottom trawl surveys. The 1971-94 means (dashed line) are from the southeast Bering Sea (see inset) and the 1973 and 1979-94 means are from the larger survey area outlined on the inset. The 1975 data point for the overall survey area is based on data collected from August through September, while those in all other years and areas were collected from June through early August.



## Relative Fishing Powers of Survey Vessels

A total of 344 alternate-row tows were used in the comparison of vessel catch rates with the methods developed by Kappenman (1992). There were 325 tows from the standard area and 19 more from the special studies work (Appendix A). Based on this analysis, the F/V Aldebaran was more efficient than the F/V Arcturus at capturing the following species and species groups: skates, Atheresthes spp., yellowfin sole, rock sole, Myoxocephalus sp., and Pacific cod. Fishing power corrections were applied to catches (by species) of the less efficient vessel (Table 6).

Table 6.--Species for which fishing power corrections were applied, and scaling factors determined by the method of Kappenman (1992) based on 344 total hauls.

Species	<u>Hauls with catch</u>		<u>Catch multiplier</u>	
	<u>Arcturus</u>	<u>Aldebaran</u>	<u>Arcturus</u>	<u>Aldebaran</u>
skates	128	113	1.16	1.0
arrowtooth flounder	73	65	1.17	1.0
Kamchatka flounder	70	52	1.18	1.0
yellowfin sole	125	120	1.01	1.0
rock sole	159	148	1.14	1.0
<u>Myoxocephalus</u> sp.	172	164	1.02	1.0
Pacific cod	123	113	1.01	1.0
Pacific halibut	136	134	1.0	1.03
<u>Hippoglossoides</u> sp.	156	151	1.0	1.10

### Estimated Biomass of Major Fish and Invertebrate Groups

Total demersal animal biomass for the overall survey area was estimated at 17.1 million t, of which fish species accounted for 83% (14.3 million t, Table 7), and invertebrates 17% (2.8 million t, Table 8). Concentrations of fish biomass were located in Bristol Bay and along the Alaska Peninsula, around the Pribilof Islands, and northwest of the Pribilofs (Fig. 7). Although 19 families and 68 species of fish were identified in the catches (Appendix B), the fish biomass was dominated by flatfishes (Pleuronectidae, 7.3 million t) and cods (Gadidae, 6.2 million t) (Table 7). The biomass of invertebrates was comprised primarily of the phyla Echinodermata (1.1 million t), Crustacea (0.8 million t), and Mollusca (0.28 million t). A total of 89 invertebrate species from 9 phyla were identified in the survey (Table 8, Appendix B).

### Relative Abundance of Individual Fish Species

Relative abundance of the 11 most abundant species and species groups of fish are shown in Figure 8. These taxa accounted for 82% (316 kg/ha) of total animal mean CPUE (390 kg/ha) and 98% of total fish mean CPUE (323 kg/ha). Overall, but particularly in water deeper than 50 m, walleye pollock were the dominant species in the catch with a mean CPUE of 106 kg/ha. Pacific cod were abundant across all depths with an overall mean CPUE of 30.4 kg/ha. Yellowfin sole and rock sole, with overall mean catch rates of 56.5 kg/ha and 66.9 kg/ha respectively, dominated catches in water less than 50 m. Yellowfin sole and rock sole were also prominent on the mid-shelf waters between 50 and 100 m along with Alaska plaice and Hippoglossoides spp. See Appendix C for a descending rank of all organisms caught.

Table 7.--Biomass estimates (t) for major fish species and fish groups taken during the 1994 eastern Bering Sea bottom trawl survey.

Taxon	Estimated total biomass (t) <sup>a</sup> and 95% confidence interval	Proportion of total animal biomass <sup>b</sup>	Estimated biomass by subarea (t)						
			1	2	3	4	5	6	
<b>Gadidae (cods)</b>									
Walleye pollock	4,977,019 ± 21%	0.279	386,584	117,436	1,748,232	596,650	525,084	1,603,034	
Pacific cod	1,368,120 ± 37%	0.077	313,296	49,787	259,047	240,270	52,095	453,625	
Other cods	6,472 ± 31%	0.000	339	766	9	4,925	0	432	
<b>Total cods</b>	<b>6,351,611 ± 22%</b>	<b>0.356</b>	<b>700,219</b>	<b>167,989</b>	<b>2,007,288</b>	<b>841,845</b>	<b>577,179</b>	<b>2,057,091</b>	
<b>Anoplopomatidae</b>									
Sablefish	0 ± 0%	0.000	0	0	0	0	0	0	
<b>Scorpaenidae (rockfish)</b>									
Pacific ocean perch	98 ± 140%	0.000	0	0	0	0	48	49	
Other rockfish	346 ± 148%	0.000	0	0	47	0	300	0	
<b>Total rockfish</b>	<b>444 ± 138%</b>	<b>0.000</b>	<b>0</b>	<b>0</b>	<b>47</b>	<b>0</b>	<b>348</b>	<b>49</b>	
<b>Pleuronectidae (flatfishes)</b>									
Yellowfin sole	2,610,474 ± 13%	0.146	1,245,478	465,687	691,378	207,066	530	336	
Rock sole	2,894,194 ± 16%	0.162	1,644,930	197,585	501,186	474,525	4,082	71,886	
Hippoglossoides spp.	726,212 ± 14%	0.041	39,675	481	339,499	67,057	102,782	176,717	
Alaska plaice	623,079 ± 17%	0.035	148,420	74,813	135,154	247,791	35	16,866	
Atheresthes spp.	570,605 ± 18%	0.032	6,082	0	162,402	21,841	172,906	207,374	
Greenland turbot	48,770 ± 46%	0.003	0	0	2,124	2,083	216	44,347	
Pacific halibut	163,330 ± 14%	0.009	43,400	10,214	40,617	20,087	15,055	33,956	
Other flatfish	54,045 ± 34%	0.003	30,914	4,951	4,229	186	11,416	2,348	
<b>Total flatfish</b>	<b>7,690,708 ± 8%</b>	<b>0.432</b>	<b>3,158,899</b>	<b>753,731</b>	<b>1,876,590</b>	<b>1,040,636</b>	<b>307,022</b>	<b>553,830</b>	
<b>Clupeidae</b>									
Pacific herring	34,994 ± 90%	0.002	28,096	4,121	1,394	1,312	0	70	
<b>Cottidae (sculpins)</b>	209,720 ± 17%	0.012	27,376	18,187	40,081	76,468	3,944	43,663	
<b>Zoarcidae (eelpouts)</b>	44,804 ± 30%	0.003	0	241	1,323	17,031	401	25,808	
<b>Osmeridae (smelts)</b>	6,643 ± 71%	0.000	1,140	266	416	217	4,590	13	
<b>Agonidae (poachers)</b>	29,175 ± 21%	0.002	7,833	3,913	9,183	7,807	184	254	
<b>Cyclopteridae (snailfishes)</b>	3,100 ± 26%	0.000	12	90	39	2,426	3	532	
<b>Rajidae (skates)</b>	414,235 ± 16%	0.023	9,082	10,223	97,436	78,686	43,185	175,622	
<b>Other fish</b>	<b>16,799 ± 58%</b>	<b>0.001</b>	<b>923</b>	<b>1,664</b>	<b>1,029</b>	<b>896</b>	<b>4,294</b>	<b>7,994</b>	
<b>Total fish</b>	<b>14,802,233 ± 10%</b>	<b>0.831</b>	<b>3,933,580</b>	<b>960,425</b>	<b>4,034,826</b>	<b>2,067,325</b>	<b>941,151</b>	<b>2,864,926</b>	

<sup>a</sup>Differences in sums of estimates and totals are due to rounding.

<sup>b</sup>Proportion of total estimated biomass, fish and invertebrates combined, for the total survey area. Total estimated biomass=17,118,991 t.

Table 8.--Biomass estimates (t) for major invertebrate species and invertebrate groups taken during the 1994 eastern Bering Sea bottom trawl survey.

Taxon	Estimated total biomass (t) <sup>a</sup> and 95% confidence interval	Proportion of total animal biomass <sup>b</sup>	Estimated biomass by subarea (t)					
			1	2	3	4	5	6
<b>Crustacea</b>								
Chionoecetes sp. (Tanner and snow crab)	448,633 ± 15%	0.025	14,766	48,280	92,567	209,812	16,903	66,304
Lithodes sp. king crab	0 ± 0%	0.000	0	0	0	0	0	0
Paralithodes sp. (king crab)	60,180 ± 37%	0.003	10,583	636	23,671	24,264	0	1,027
Erimacrus isenbeckii (hair crab)	4,339 ± 42%	0.000	109	607	695	2,909	17	0
Paguridae hermit crab	349,667 ± 15%	0.020	25,806	20,934	134,961	105,677	4,632	57,657
Other crab	<u>37,121 ± 36%</u>	<u>0.002</u>	<u>10,245</u>	<u>7,845</u>	<u>6,913</u>	<u>11,660</u>	<u>186</u>	<u>271</u>
Total crab	899,938 ± 11%	0.050	61,509	78,302	258,808	354,321	21,738	125,259
Shrimps	4,315 ± 34%	0.000	243	95	0	535	168	3,273
Other crustaceans	<u>445 ± 146%</u>	<u>0.000</u>	<u>23</u>	<u>0</u>	<u>0</u>	<u>334</u>	<u>0</u>	<u>88</u>
Total crustaceans	904,698 ± 11%	0.051	61,776	78,397	258,808	355,190	21,906	128,620
<b>Mollusca</b>								
Gastropoda (snails)	278,695 ± 15%	0.016	19,465	17,384	114,462	70,031	6,742	50,609
Pelecypoda (bivalves)	7,205 ± 75%	0.000	681	909	4,390	929	71	225
Squids	8 ± 148%	0.000	0	0	0	0	5	3
Octopuses	2,183 ± 88%	0.000	0	0	788	237	5	1,153
Other mollusks	<u>0 ± 0%</u>	<u>0.000</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total mollusks	288,091 ± 15%	0.016	20,146	18,293	119,641	71,197	6,824	51,990
<b>Echinodermata</b>								
Asteroidea (starfish)	1,061,146 ± 14%	0.060	390,492	194,154	325,619	120,421	3,586	26,875
Ophiuroidea (brittle stars)	159,767 ± 26%	0.009	3,788	525	35,697	21,575	4,782	93,401
Echinoidea (sea urchin)	6,856 ± 55%	0.000	38	0	2,983	242	1,513	2,080
Holothuroidea (sea cucumbers)	<u>8,374 ± 71%</u>	<u>0.000</u>	<u>2,665</u>	<u>0</u>	<u>4,356</u>	<u>1,316</u>	<u>0</u>	<u>37</u>
Total echinoderms	1,237,528 ± 13%	0.069	397,274	194,679	368,749	144,234	10,176	122,415
Ascidiacea	224,641 ± 31%	0.013	30,431	7,305	100,428	86,478	0	0
Porifera (sponges)	135,923 ± 79%	0.008	2,921	273	125,917	6,332	41	439
Coelenterata	213,608 ± 34%	0.012	16,733	1,096	131,056	30,580	18,710	15,434
Other invertebrates	<u>16,359 ± 92%</u>	<u>0.001</u>	<u>2,377</u>	<u>286</u>	<u>2,509</u>	<u>1,347</u>	<u>304</u>	<u>9,536</u>
Total invertebrates	3,019,463 ± 8%	0.169	531,368	300,329	1,107,012	694,678	57,666	328,411

<sup>a</sup>Differences in sums of estimates and totals are due to rounding.

<sup>b</sup>Proportion of total estimated biomass, fish and invertebrates combined, for the total survey area. Total estimated biomass=17,118,991 t.

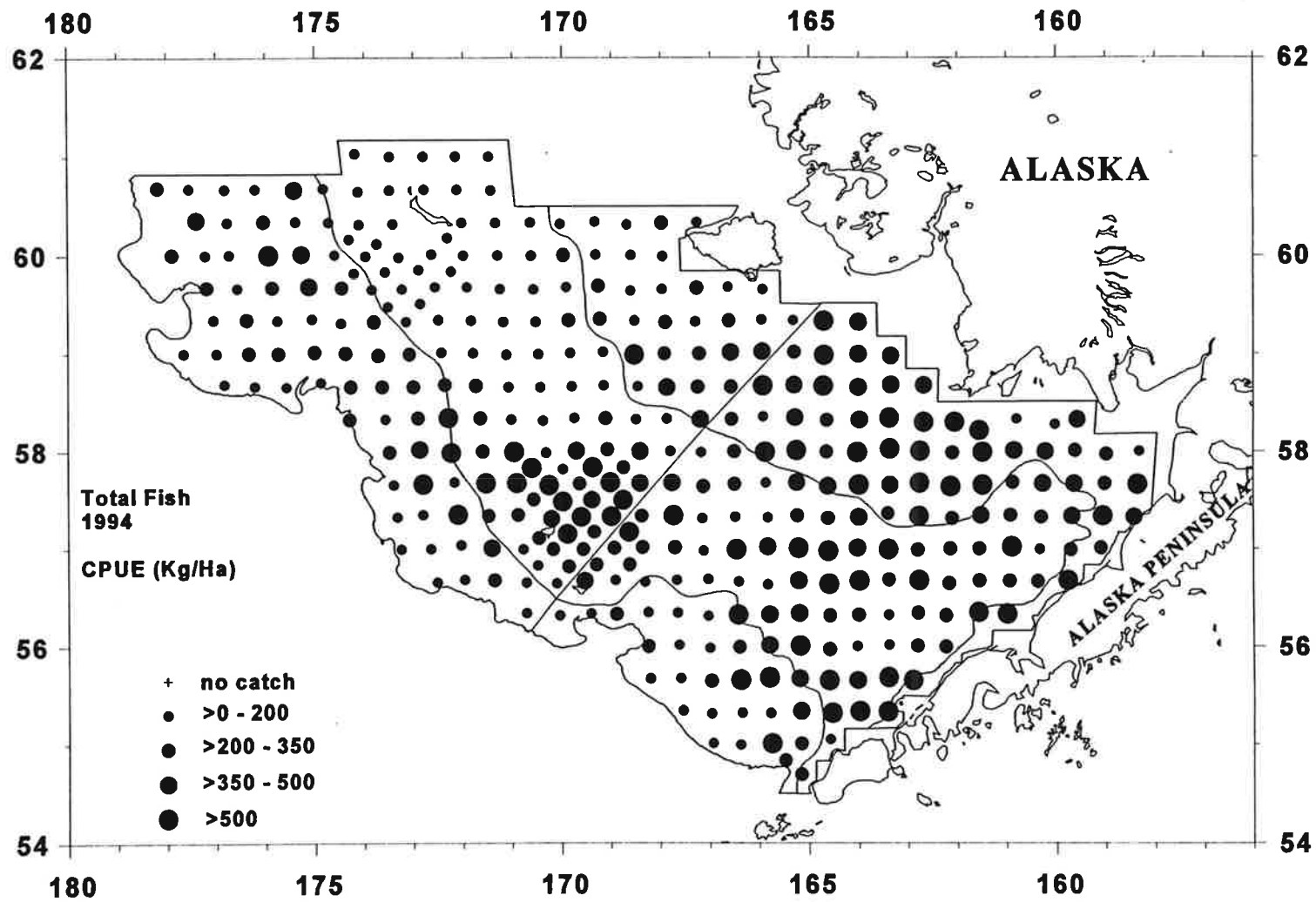


Figure 7.--Distribution and relative abundance of total fish, 1994 eastern Bering Sea bottom trawl survey.

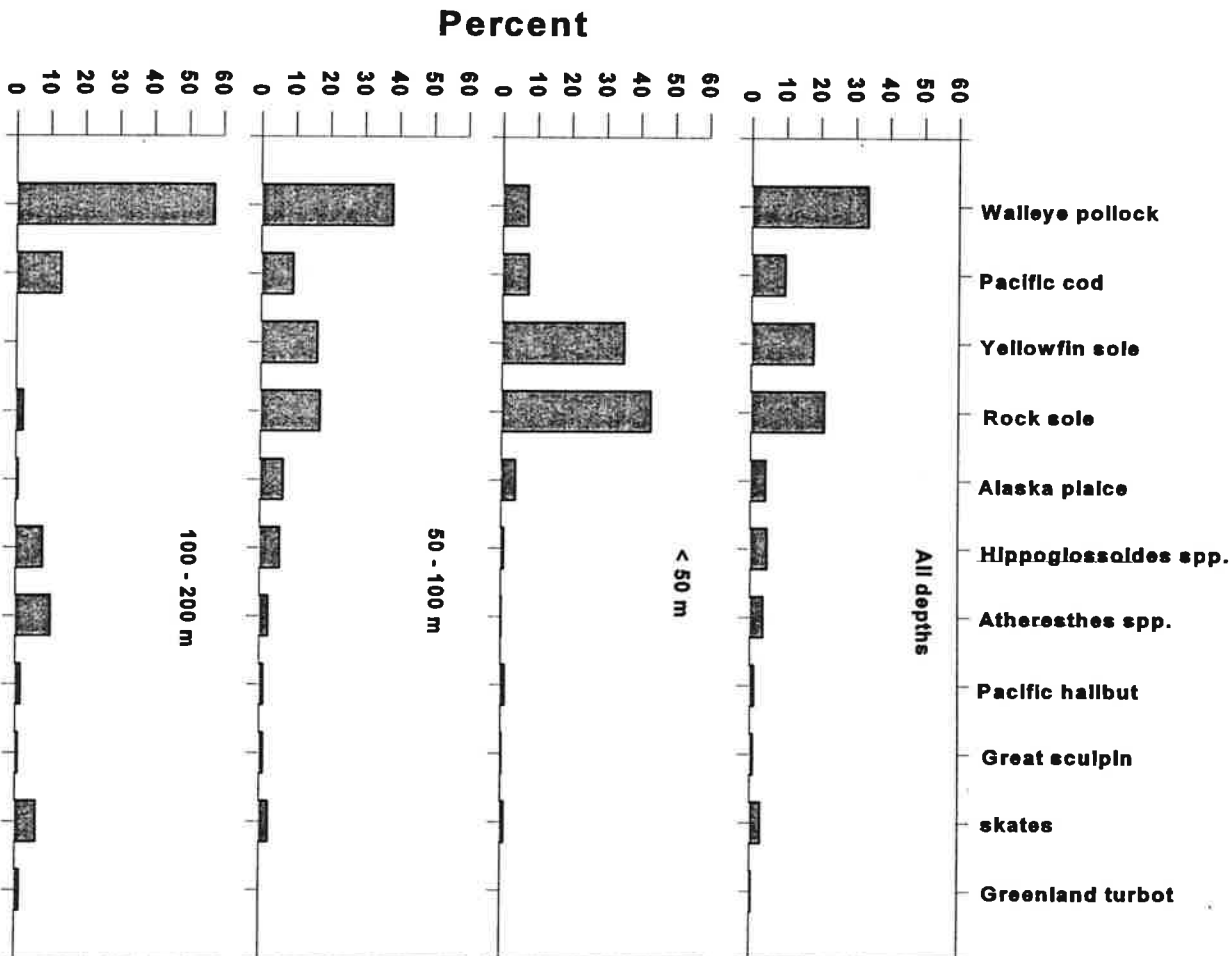


Figure 8.--Relative abundance (%CPUE in kg/ha) of principal groundfish species (top 11 for all depths combined) by depth zones and for all depths combined, 1994 eastern Bering Sea bottom trawl survey.

Abundance, Distribution, and Size and Age Composition of  
Principal Species and Species Groups

Geographical distributions, population numbers, biomass estimates, and size composition are presented for each of the following commercially important eastern Bering Sea groundfish: walleye pollock, Pacific cod, yellowfin sole, rock sole, Hippoglossoides spp., Alaska plaice, Greenland turbot (Reinhardtius hippoglossoides), Atheresthes spp., and Pacific halibut. Estimated biomass, population numbers, and mean size (by length and weight) are summarized by subarea and for the entire survey area. Size composition data are illustrated in histograms relating the population percentage of length by centimeter interval for each subarea and in population numbers for the total survey area. Age composition and von Bertalanffy growth parameters are given for walleye pollock, yellowfin sole, and rock sole. Geographical distributions for some common, but generally noncommercial fish species are presented. These are total skates, great sculpin (Myoxocephalus polyacanthocephalus), plain sculpin (M. jaok), bigmouth sculpin (Hemitripterus bolini), wattled eelpout (Lycodes palearis), shortfin eelpout (L. brevipes), marbled eelpout (L. ravidens), sturgeon poacher (Podothecus acipenserinus), Bering poacher (Ocella dodecaedron), eulachon (Thaleichthys pacificus), capelin (Mallotus villosus), and Pacific herring (Clupea pallasii). Biomass and population estimates as well as mean weight are given by subarea and total area. These tables are not given for the pelagic species eulachon, capelin, and Pacific herring due to the bottom sampling nature of the survey. We do not believe these species are adequately represented in the samples, however, plots are shown to give some idea of geographic distribution.

Appendices to the report contain detailed results of the analysis. CPUE, population, and biomass estimates as well as the variances and confidence limits for each species by stratum are

given in Appendix D. Population estimates by sex and size class for the total survey area are listed in Appendix E.



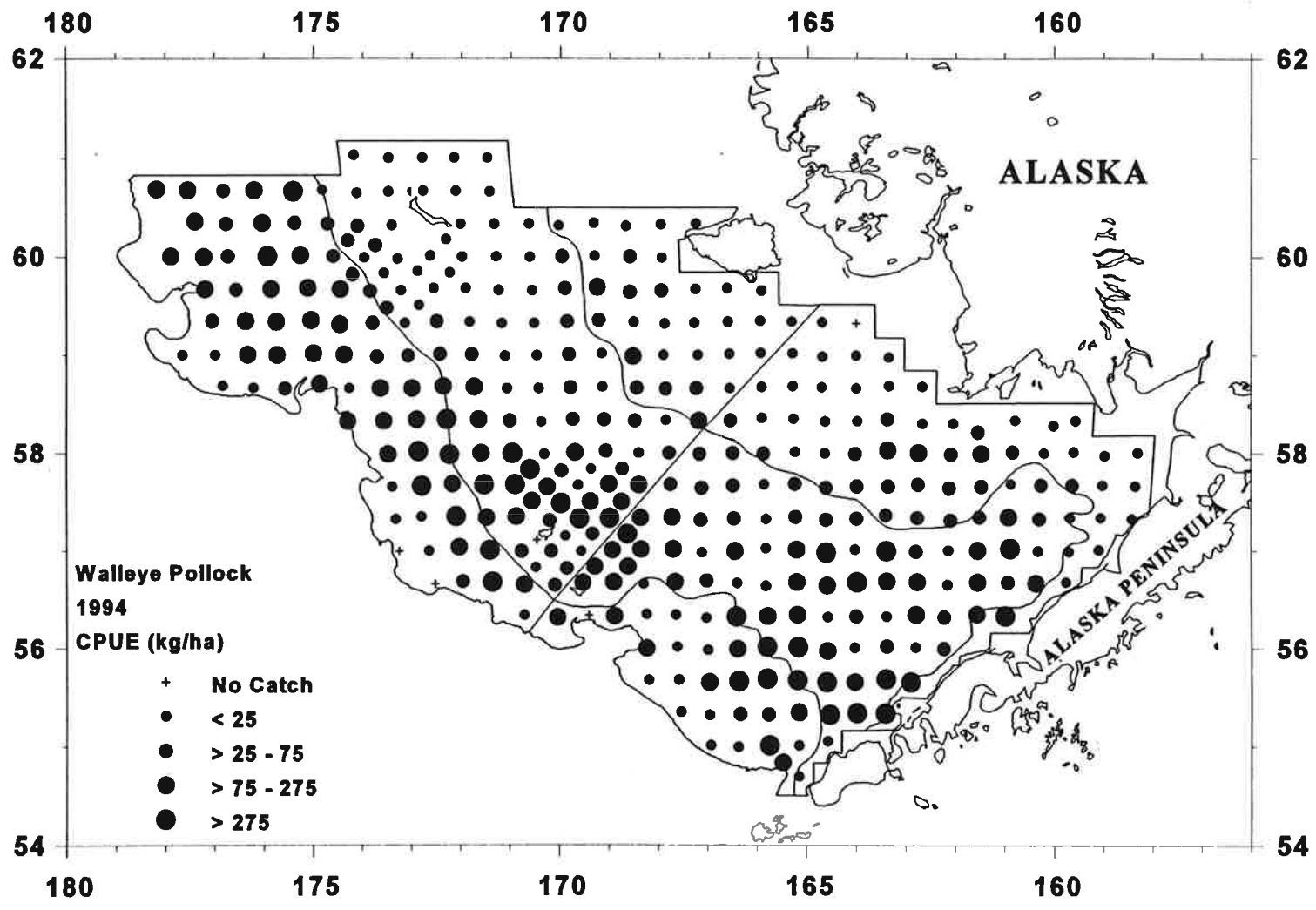


Figure 9.-- Distribution and relative abundance of walleye pollock. 1994 eastern Bering Sea bottom trawl survey.

Table 9.--Abundance estimates and mean size of walleye pollock by subarea, 1994 eastern Bering Sea bottom trawl survey.

Subarea	Mean CPUE (kg/ha)	Estimated biomass (t) <sup>a</sup>	Proportion of estimated biomass	Estimated population numbers <sup>a</sup>	Proportion of estimated population	Mean Size Weight (kg)	Length (cm)
1	49.64	386,584	0.078	349,100,355	0.042	1.107	47.5
2	28.62	117,436	0.024	134,037,431	0.016	0.876	39.0
3	169.24	1,748,232	0.351	2,704,806,646	0.327	0.646	43.8
4	55.34	596,650	0.120	1,065,704,653	0.129	0.560	35.0
5	135.36	525,084	0.106	728,699,262	0.088	0.721	45.6
6	169.52	1,603,034	0.322	3,289,998,000	0.398	0.487	36.7
All subareas combined <sup>b</sup>	107.41	4,977,019	1.000	8,272,346,348	1.000	0.602	40.0
95% Confidence interval		±1,043,410		±1,925,602,316			

<sup>a</sup> Variances of abundance estimates are given in Appendix D.

<sup>b</sup> Differences in sums of estimates and totals are due to rounding.

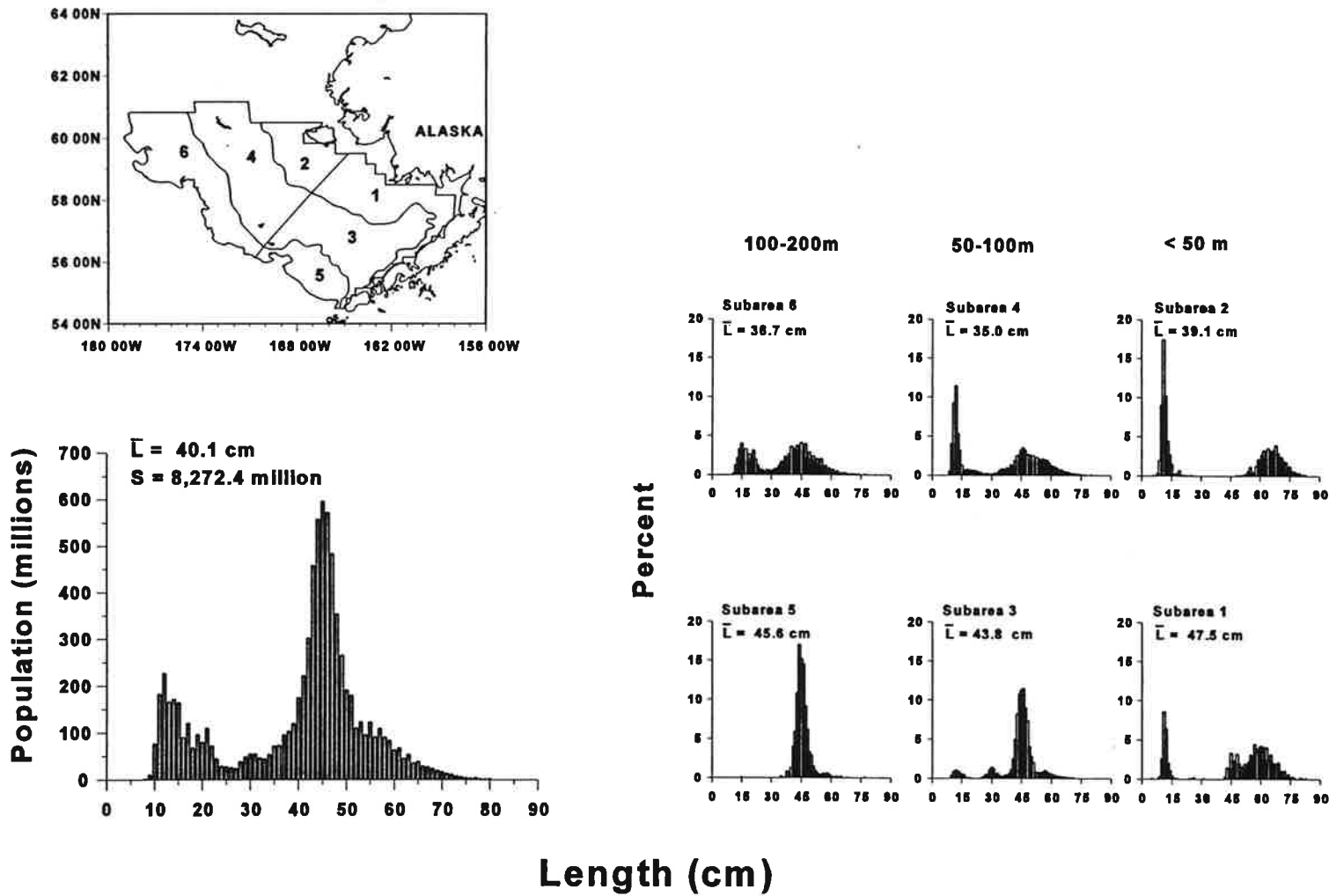


Figure 10.--Estimated relative size distribution (sexes combined) of walleye pollock in terms of population numbers and percent for subareas 1-6, 1994 eastern Bering Sea bottom trawl survey.

Table 10.--Estimated population numbers (millions of fish) of walleye pollock by age group and subarea, 1994 eastern Bering Sea bottom trawl survey.

AGE	YEAR CLASS	6	5	4	3	2	1	ALL SUBAREAS COMBINED	PROPORTION
0	1992	1.07	0.00	14.13	3.19	3.33	4.20	25.92	0.0031
1	1991	575.91	0.54	380.05	136.47	61.09	71.17	1,225.24	0.1481
2	1990	467.02	0.44	43.28	76.48	1.15	1.34	589.71	0.0713
3	1989	243.98	7.82	27.63	121.47	0.03	0.49	401.41	0.0485
4	1988	415.87	154.87	75.11	452.42	0.01	8.61	1,106.89	0.1338
5	1987	939.80	426.53	225.08	1,364.55	0.62	50.89	3,007.46	0.3636
6	1986	154.87	84.20	41.81	235.86	0.20	9.90	526.85	0.0637
7	1985	57.01	12.25	17.79	47.41	0.21	4.37	139.05	0.0168
8	1984	55.33	6.95	20.41	29.41	1.62	7.55	121.28	0.0147
9	1983	57.28	4.61	26.40	28.65	3.84	16.44	137.23	0.0166
10	1982	100.81	11.63	50.05	59.97	6.80	31.26	260.52	0.0315
11	1981	50.22	5.03	33.12	38.31	5.21	27.95	159.84	0.0193
12	1980	71.02	7.13	46.33	48.74	11.29	40.31	224.82	0.0272
13	1979	24.56	2.19	16.95	17.12	5.67	16.11	82.61	0.0100
14	1978	21.27	2.13	16.45	16.99	7.04	16.50	80.37	0.0097
15	1977	12.60	0.44	9.76	10.00	7.46	16.30	56.56	0.0068
16	1976	14.99	1.18	7.28	6.92	1.55	4.13	36.05	0.0044
17	1975	4.12	0.23	4.52	4.43	3.97	6.94	24.22	0.0029
20	1972	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0000
21	1971	1.42	0.02	1.14	1.25	1.26	1.44	6.52	0.0008
Age Unknown		20.83	0.50	8.43	5.16	11.68	13.20	59.80	0.0072
All Ages Combined		3,290.00	728.70	1,065.70	2,704.81	134.04	349.10	8,272.35	1.0000

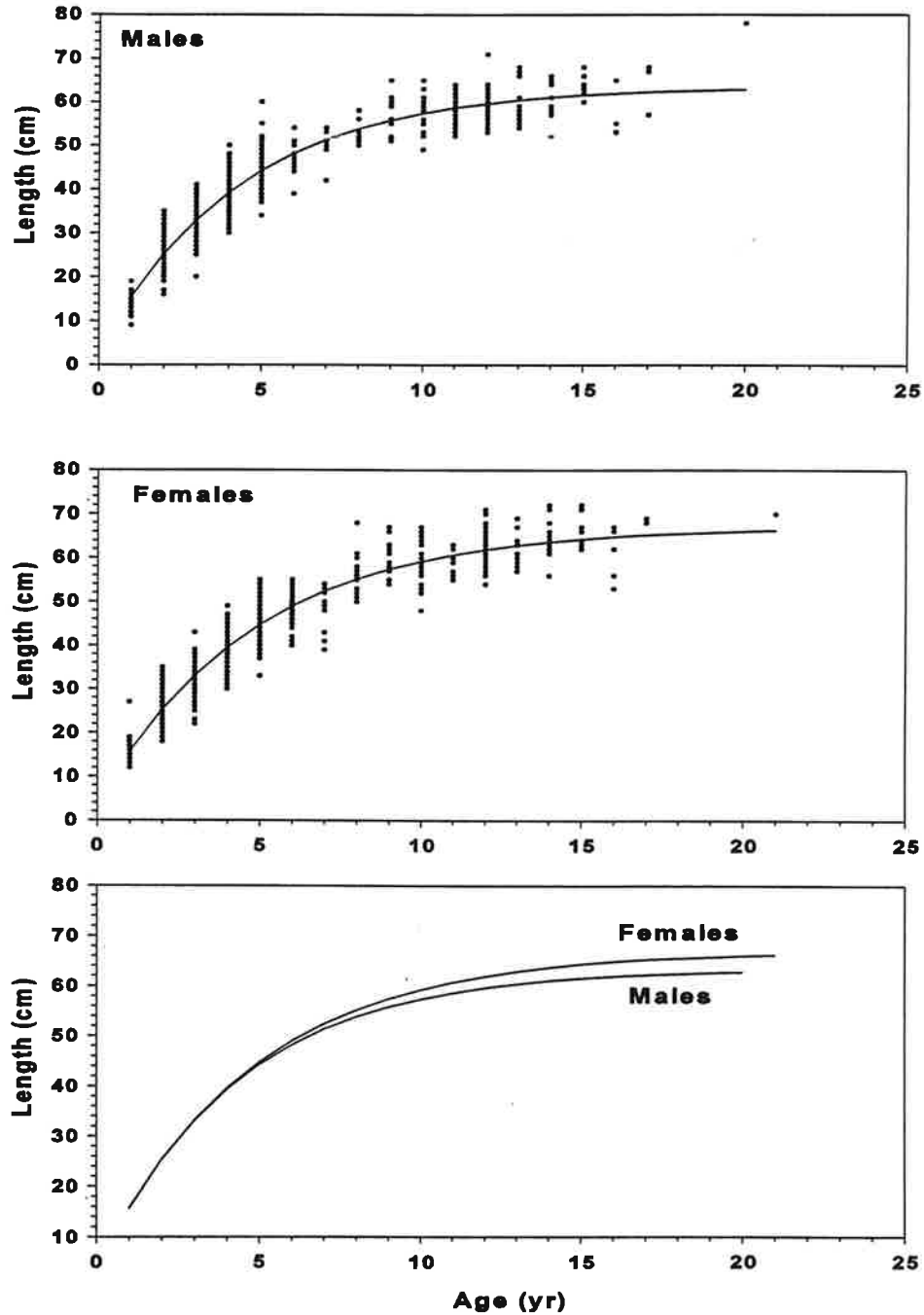


Figure 11.--Distribution of walleye pollock aged samples from the 1994 eastern Bering Sea bottom trawl survey by length for males, females, and compared showing non-linear von-Bertalanffy estimates.

Table 11.--von-Bertalanffy growth parameter estimates for walleye pollock by sex, based on otolith age reading and length data from the 1994 eastern Bering Sea bottom trawl survey.

Sex	Number of age readings	Age range (years)	Length range (cm)	Parameters		
				$L_{inf}$	K	$t_0$
Male	501	1-20	9-78	63.5	0.23	-0.23
Female	603	1-21	12-72	175.1	0.07	-0.31

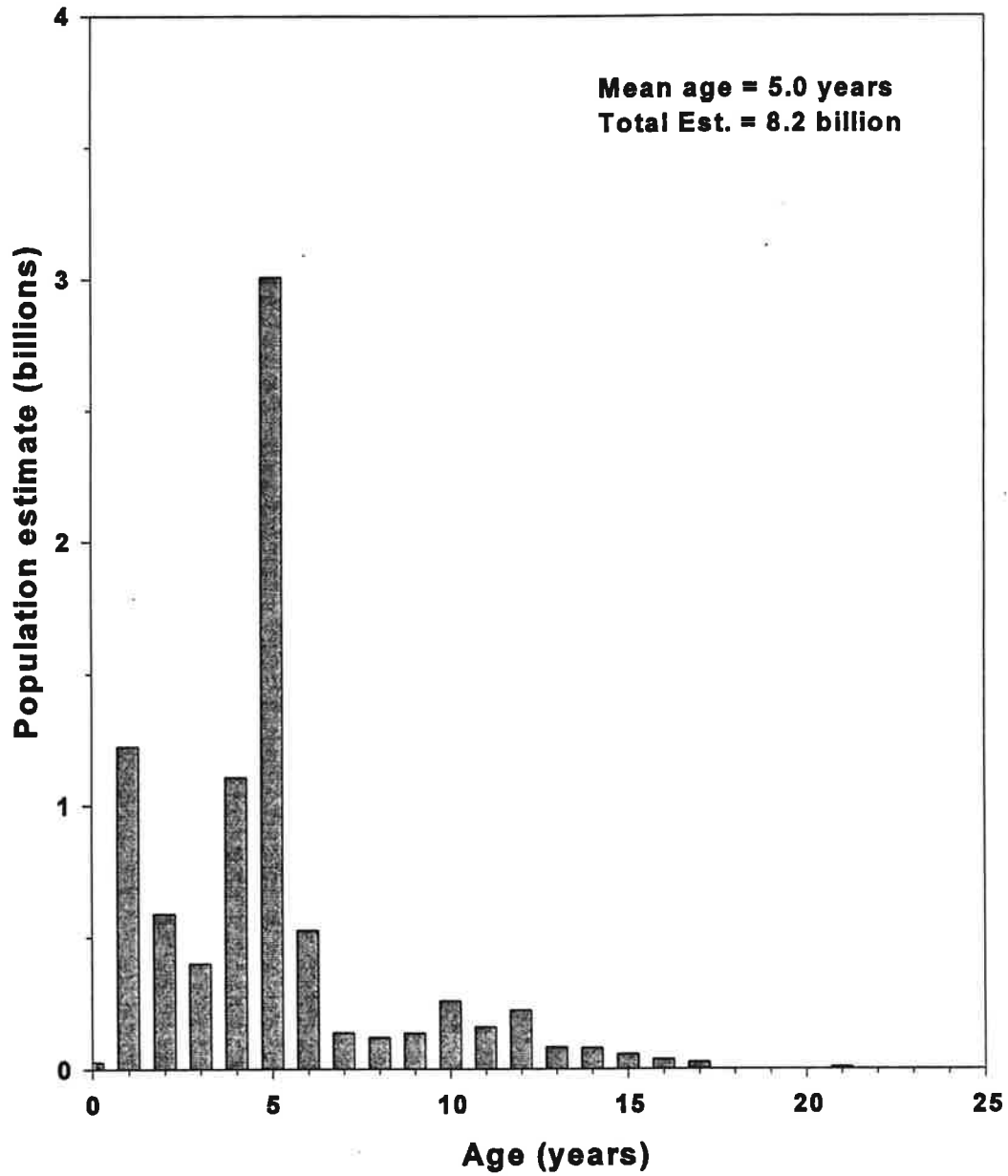


Figure 12.--Population number estimates by age for walleye pollock, 1994 eastern Bering Sea bottom trawl survey.

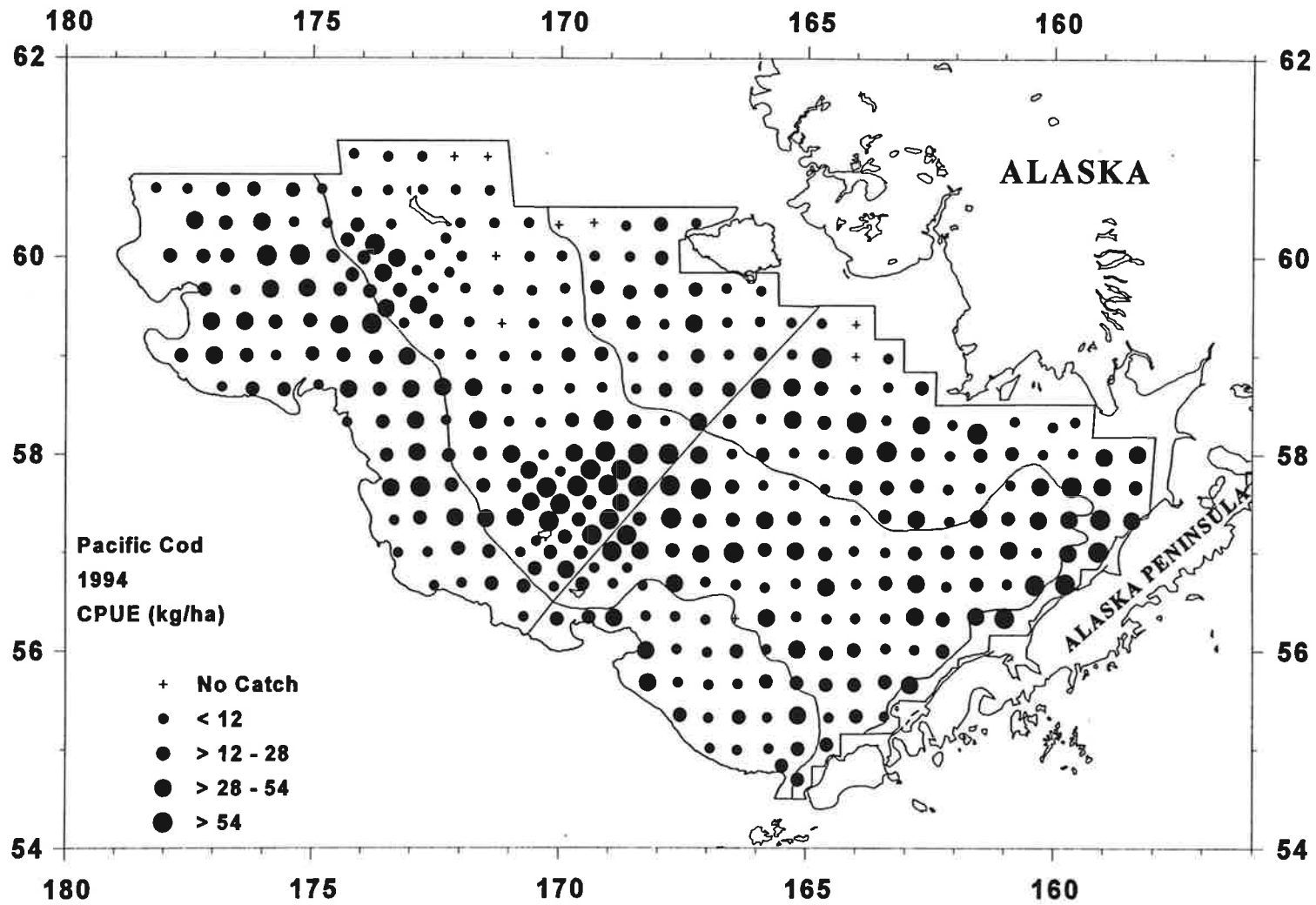


Figure 13.--Distribution and relative abundance in kg/ha of Pacific cod, 1994 eastern Bering Sea bottom trawl survey.



Table 12.--Abundance estimates and mean size of Pacific cod by subarea, 1994 eastern Bering Sea bottom trawl survey.

Subarea	Mean CPUE (kg/ha)	Estimated biomass (t) <sup>a</sup>	Proportion of estimated biomass	Estimated population numbers <sup>a</sup>	Proportion of estimated population	Mean Weight (kg)	Mean Size Length (cm)
1	40.23	313,296	0.229	447,556,393	0.362	0.700	38.3
2	12.14	49,787	0.036	34,099,201	0.028	1.460	43.5
3	25.08	259,047	0.189	212,893,865	0.172	1.217	42.6
4	22.28	240,270	0.176	332,290,043	0.268	0.723	36.0
5	13.43	52,095	0.038	20,233,957	0.016	2.575	57.2
6	47.97	453,625	0.332	190,684,821	0.154	2.379	55.4
All subareas combined <sup>b</sup>	29.52	1,368,120	1.000	1,237,758,281	1.000	1.105	41.5
95% Confidence interval		±500,088		±303,178,011			

<sup>a</sup> Variances of abundance estimates are given in Appendix D.

<sup>b</sup> Differences in sums of estimates and totals are due to rounding.

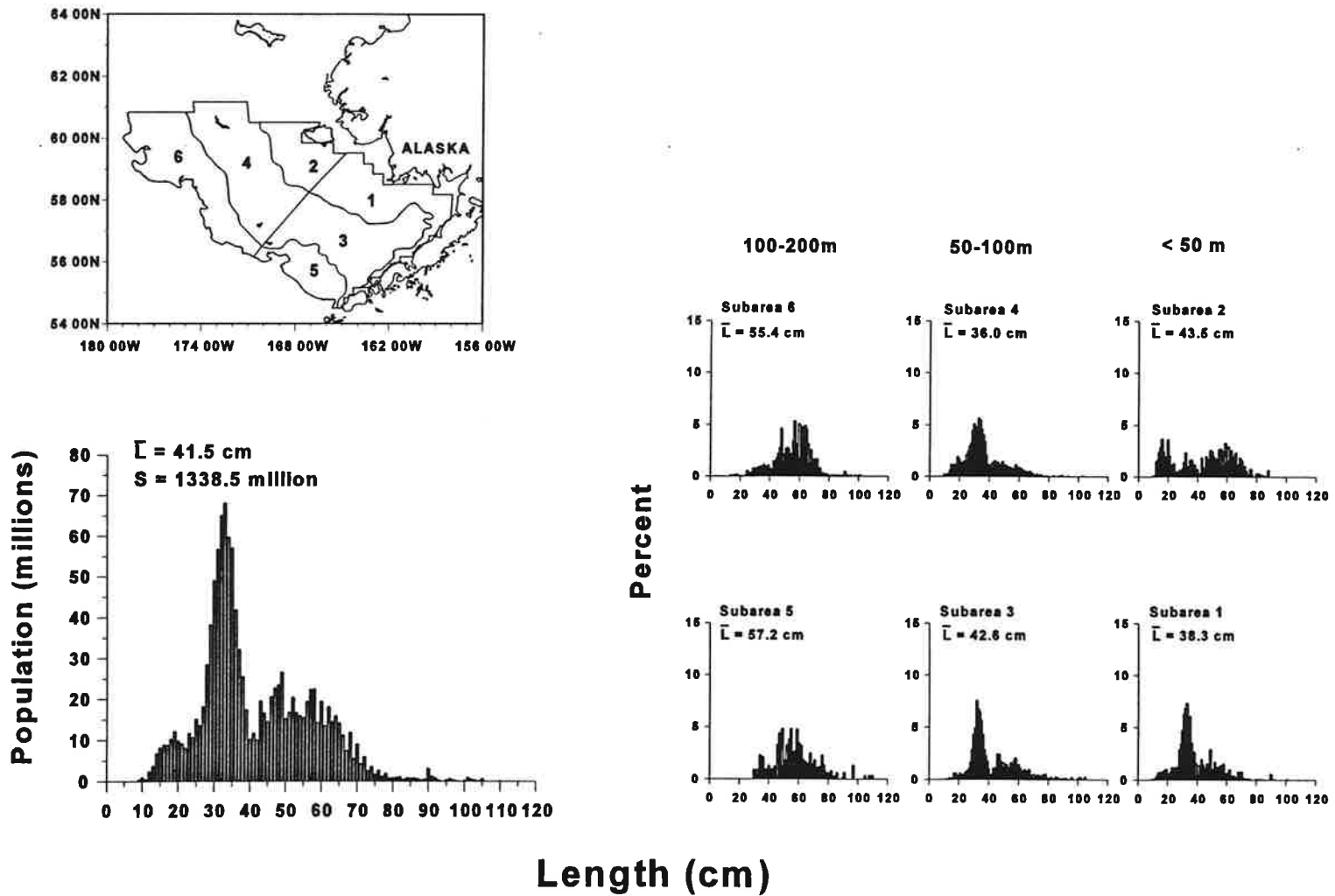


Figure 14.--Estimated relative size distribution (sexes combined) of Pacific cod in terms of population numbers, and percent for subareas 1-6, 1994 eastern Bering Sea bottom trawl survey.

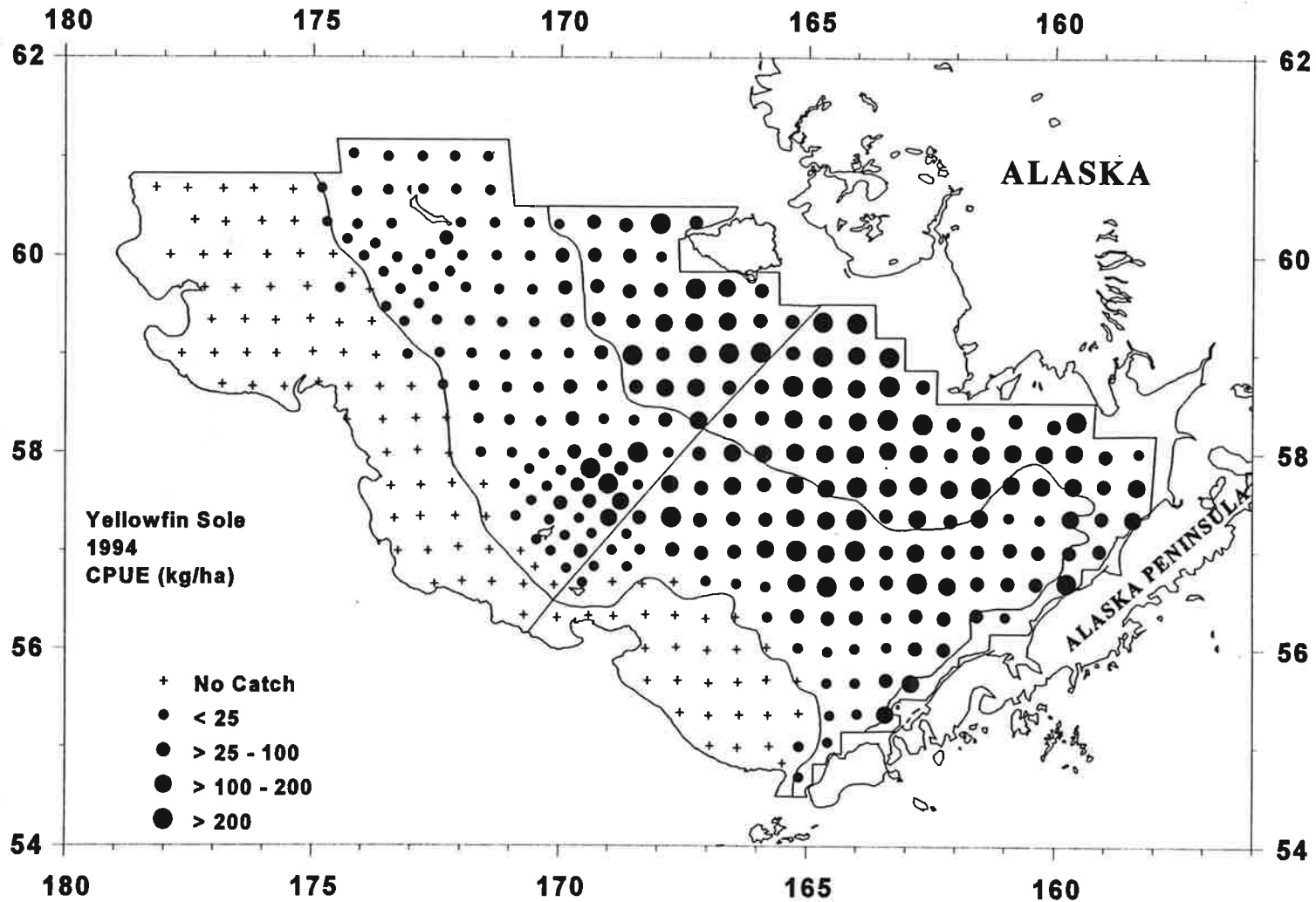


Figure 15.--Distribution and relative abundance in kg/ha of yellowfin sole, 1994 eastern Bering Sea bottom trawl survey.

Table 13.--Abundance estimates and mean size of yellowfin sole by subarea, 1994 eastern Bering Sea bottom trawl survey.

Subarea	Mean CPUE (kg/ha)	Estimated biomass (t) <sup>a</sup>	Proportion of estimated biomass	Estimated population numbers <sup>a</sup>	Proportion of estimated population	Mean Size Weight (kg)	Mean Size Length (cm)
1	159.94	1,245,478	0.477	5,285,437,480	0.494	0.236	26.3
2	113.51	465,687	0.178	2,280,121,278	0.213	0.204	24.6
3	66.93	691,378	0.265	2,522,233,535	0.236	0.274	28.1
4	19.20	207,066	0.079	610,681,433	0.057	0.339	29.6
5	0.14	530	0.000	857,691	0.000	0.618	35.4
6	0.04	336	0.000	629,915	0.000	0.533	33.7
All subareas combined	56.34	2,610,474	1.000	10,699,961,333	1.000	0.244	26.6
95% Confidence interval		±343,657		±1,532,563,693			

<sup>a</sup> Variances of abundance estimates are given in Appendix D.

<sup>b</sup> Differences in sums of estimates and totals are due to rounding.

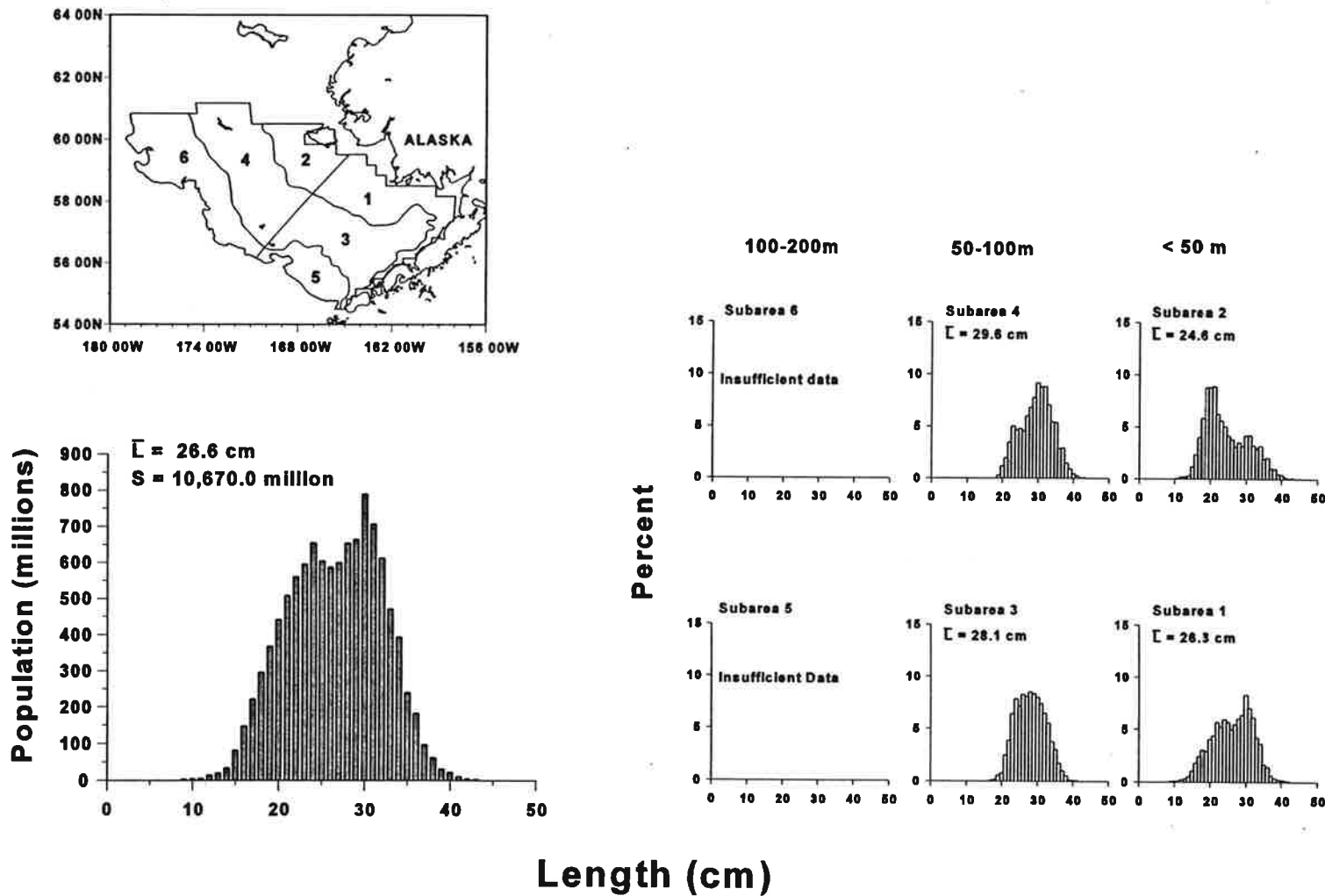


Figure 16.--Estimated size distribution (sexes combined) of yellowfin sole in terms of population numbers, and percent for subareas 1-6, 1994 eastern Bering Sea bottom trawl survey.

Table 14.--Estimated population numbers (millions of fish) of yellowfin sole by age group and subarea, 1994 eastern Bering Sea bottom trawl survey.

AGE	YEAR CLASS	6	5	4	3	2	1	ALL SUBAREAS COMBINED	PROPORTION
2	1990	0.00	0.00	0.00	0.00	1.05	3.18	4.24	0.0004
3	1989	0.00	0.00	0.03	0.13	27.66	47.38	75.20	0.0070
4	1988	0.00	0.00	0.56	1.80	69.60	93.81	165.77	0.0155
5	1987	0.00	0.00	7.67	37.67	136.19	207.30	388.84	0.0363
6	1986	0.01	0.00	19.39	106.58	344.03	474.63	944.64	0.0883
7	1985	0.06	0.00	63.74	348.76	563.09	881.75	1,857.40	0.1736
8	1984	0.02	0.00	51.39	319.48	224.75	615.20	1,210.83	0.1132
9	1983	0.01	0.00	57.07	236.14	130.78	365.04	789.04	0.0737
10	1982	0.03	0.02	37.44	155.80	70.26	211.78	475.32	0.0444
11	1981	0.09	0.10	146.83	618.40	267.00	959.76	1,992.18	0.1862
12	1980	0.00	0.00	0.30	4.03	2.69	18.70	25.72	0.0024
13	1979	0.10	0.13	74.07	293.41	150.83	619.33	1,137.87	0.1063
14	1978	0.00	0.00	6.38	23.97	12.96	46.37	89.67	0.0084
15	1977	0.04	0.15	37.48	109.27	63.08	195.67	405.69	0.0379
16	1976	0.03	0.08	19.78	46.42	29.34	57.84	153.48	0.0143
17	1975	0.00	0.03	5.88	18.55	11.63	42.52	78.61	0.0073
18	1974	0.03	0.03	11.53	27.49	18.81	46.72	104.60	0.0098
19	1973	0.06	0.12	22.88	58.73	43.38	126.08	251.25	0.0235
20	1972	0.04	0.04	10.05	24.90	18.61	51.34	104.99	0.0098
21	1971	0.00	0.03	5.78	15.80	10.39	28.16	60.16	0.0056
22	1970	0.00	0.01	4.26	12.83	7.46	23.05	47.61	0.0044
23	1969	0.02	0.03	4.52	10.85	13.85	32.28	61.56	0.0058
24	1968	0.03	0.06	13.42	30.11	32.00	68.70	144.31	0.0135
25	1967	0.01	0.02	4.51	11.67	5.24	11.36	32.81	0.0031
26	1966	0.02	0.00	0.83	0.63	3.52	6.09	11.10	0.0010
27	1965	0.01	0.02	3.41	8.20	6.35	13.26	31.26	0.0029
29	1963	0.02	0.00	0.79	0.39	1.52	1.69	4.42	0.0004
Age Unknown		0.00	0.00	0.72	0.22	14.03	36.45	51.41	0.0048
All Ages Combined		0.63	0.86	610.68	2,522.23	2,280.12	5,285.44	10,699.96	1.0000

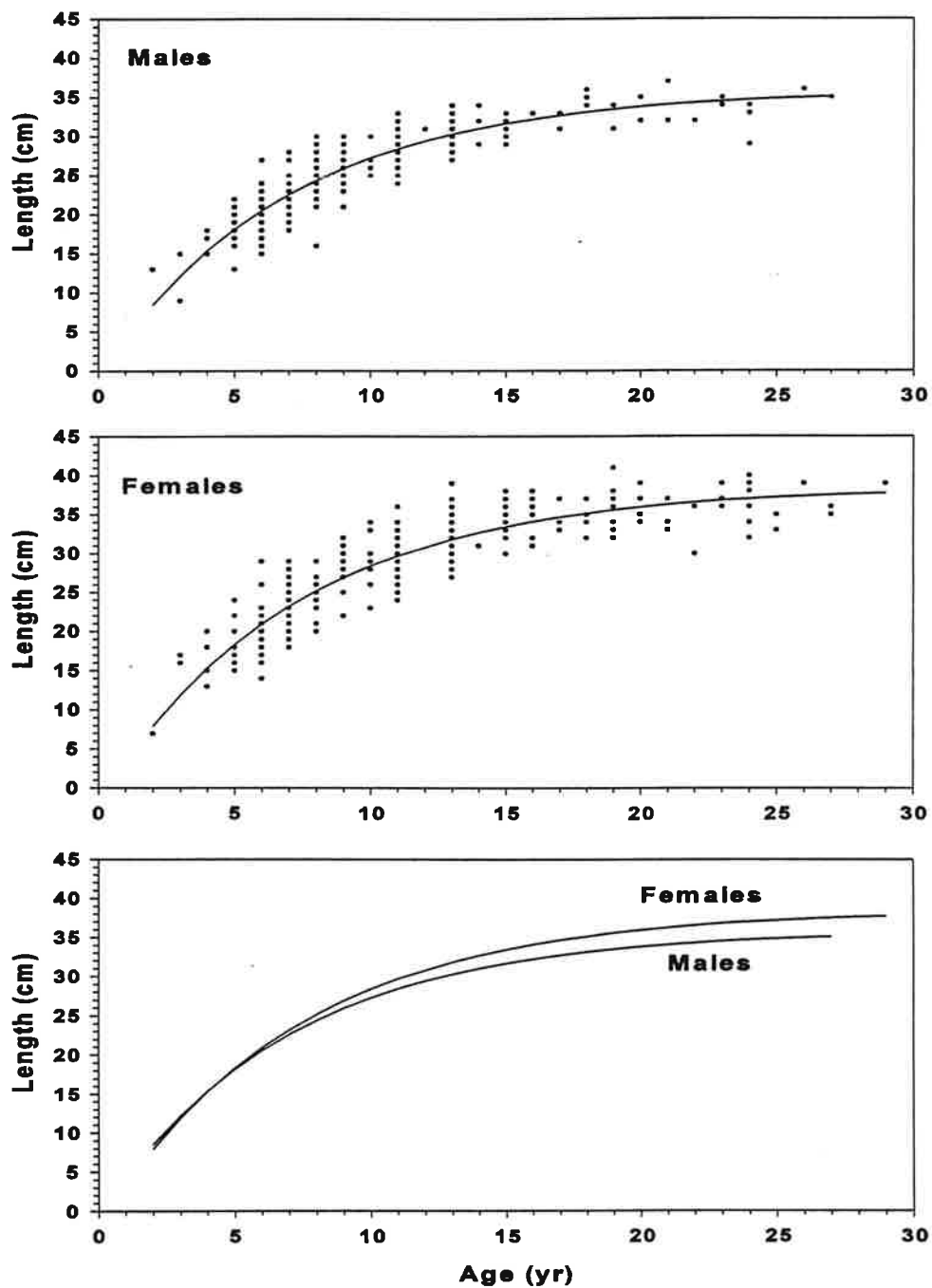


Figure 17.--Distribution of yellowfin sole aged samples from the 1994 eastern Bering Sea bottom trawl survey by length for males, females, and compared with non-linear von-Bertalanffy estimates.

Table 15.--von-Bertalanffy growth parameter estimates for yellowfin sole by sex, based on otolith age reading and length data from the 1994 eastern Bering Sea bottom trawl survey.

Sex	Number of age readings	Age range (years)	Length range (cm)	Parameters		
				$L_{inf}$	K	$t_0$
Male	231	2-27	9-37	35.8	0.14	0.12
Female	291	2-29	7-41	38.5	0.14	0.33



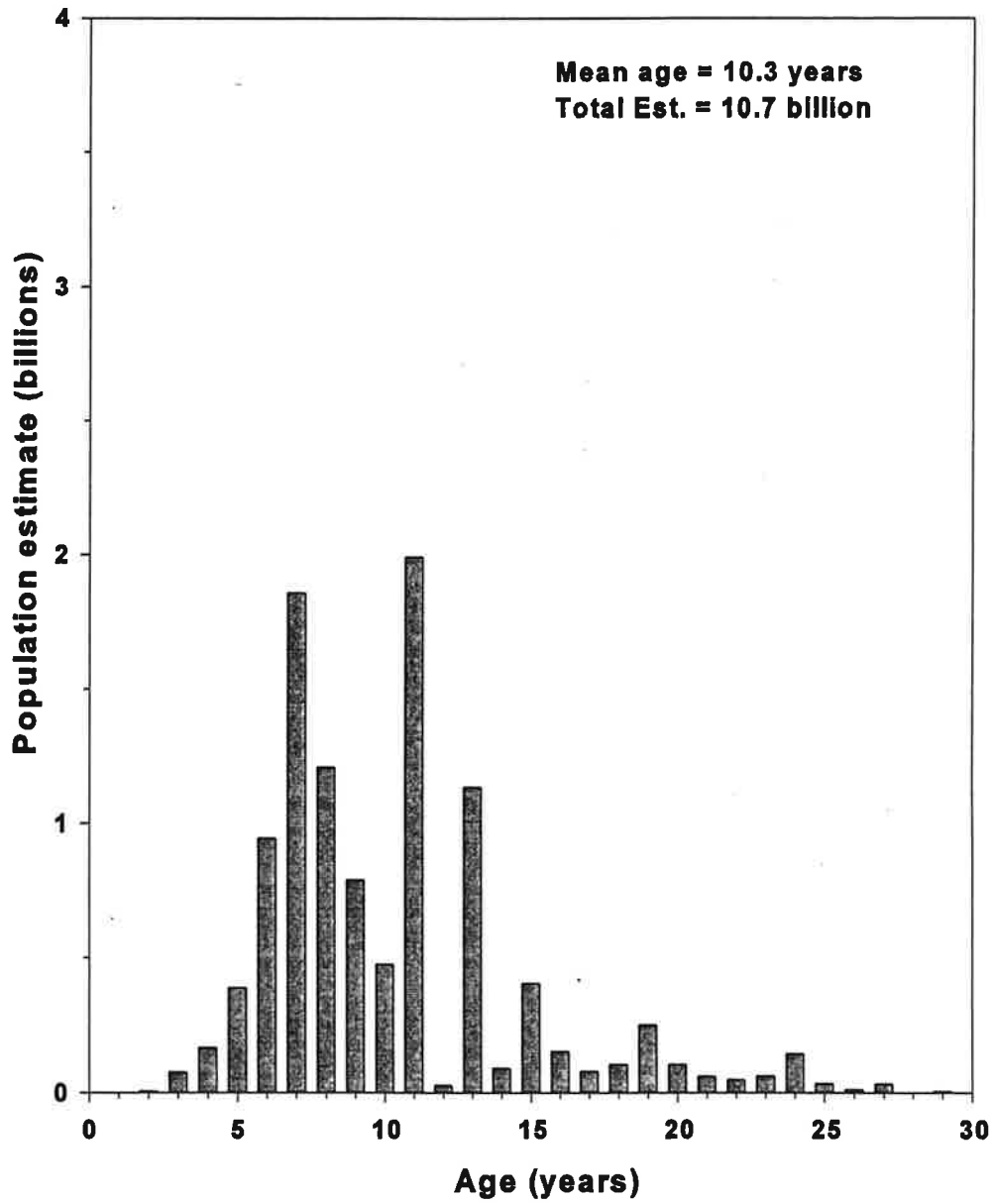


Figure 18.--Population number estimates by age for yellowfin sole, 1994 eastern Bering Sea bottom trawl survey.

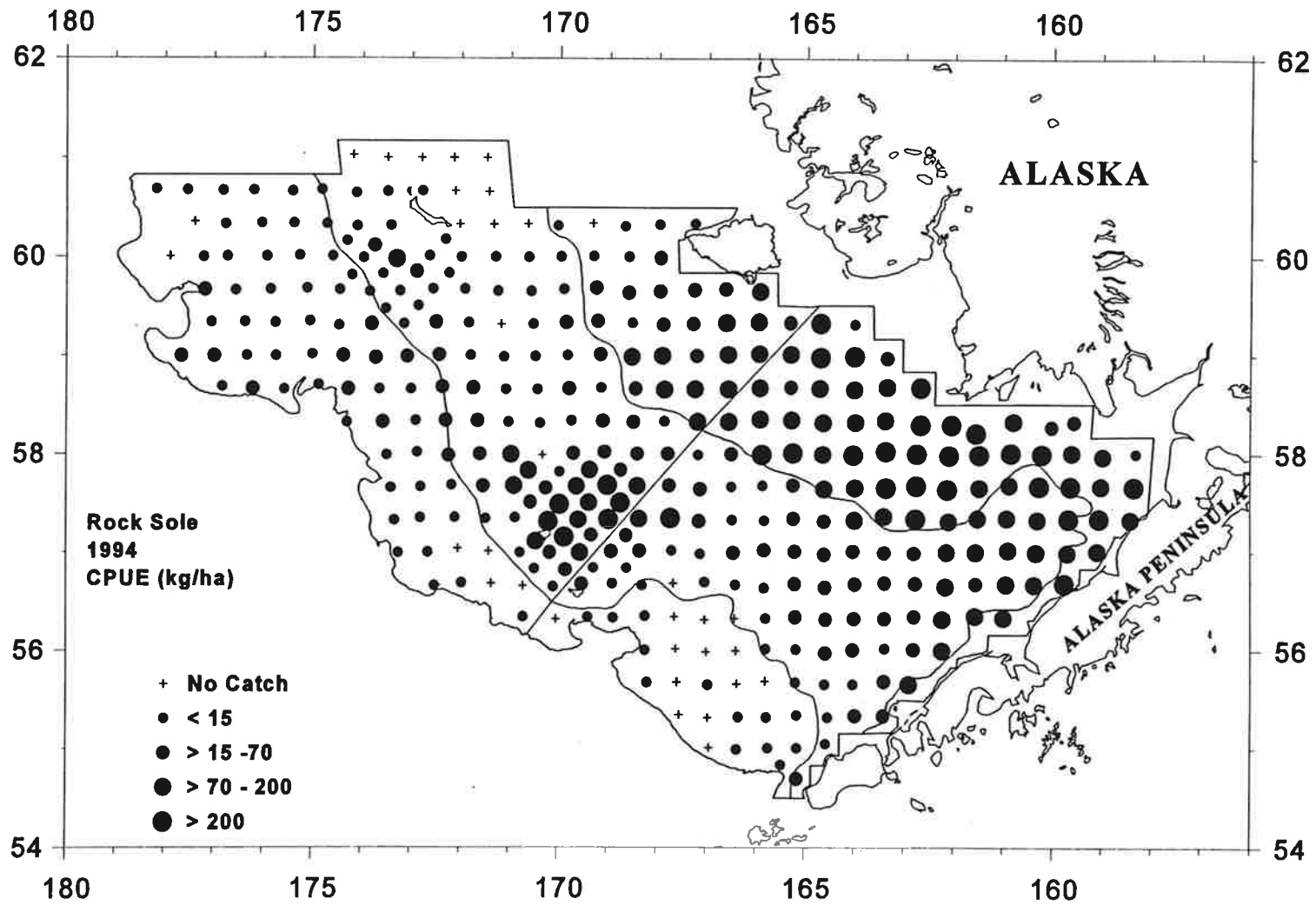


Figure 19.--Distribution and relative abundance in kg/ha of rock sole, 1994 eastern Bering Sea bottom trawl survey.

Table 16.--Abundance estimates and mean size of rock sole by subarea, 1994 eastern Bering Sea bottom trawl survey.

Subarea	Mean CPUE (kg/ha)	Estimated biomass (t) <sup>a</sup>	Proportion of estimated biomass	Estimated population numbers <sup>a</sup>	Proportion of estimated population	Mean Weight (kg)	Size Length (cm)
1	211.24	1,644,930	0.568	9,340,369,787	0.602	0.176	23.4
2	48.16	197,585	0.068	1,175,840,883	0.076	0.168	22.2
3	48.52	501,186	0.173	2,794,334,931	0.180	0.179	24.5
4	44.01	474,525	0.164	2,051,906,941	0.132	0.231	26.1
5	1.05	4,082	0.001	10,918,503	0.001	0.374	30.3
6	7.60	71,886	0.025	151,403,479	0.010	0.475	32.2
All subareas combined <sup>b</sup>	62.46	2,894,194	1.000	15,524,774,524	1.000	0.186	24.0
95% Confidence interval		±465,763		±2,570,492,822			

<sup>a</sup> Variances of abundance estimates are given in Appendix D.

<sup>b</sup> Differences in sums of estimates and totals are due to rounding.

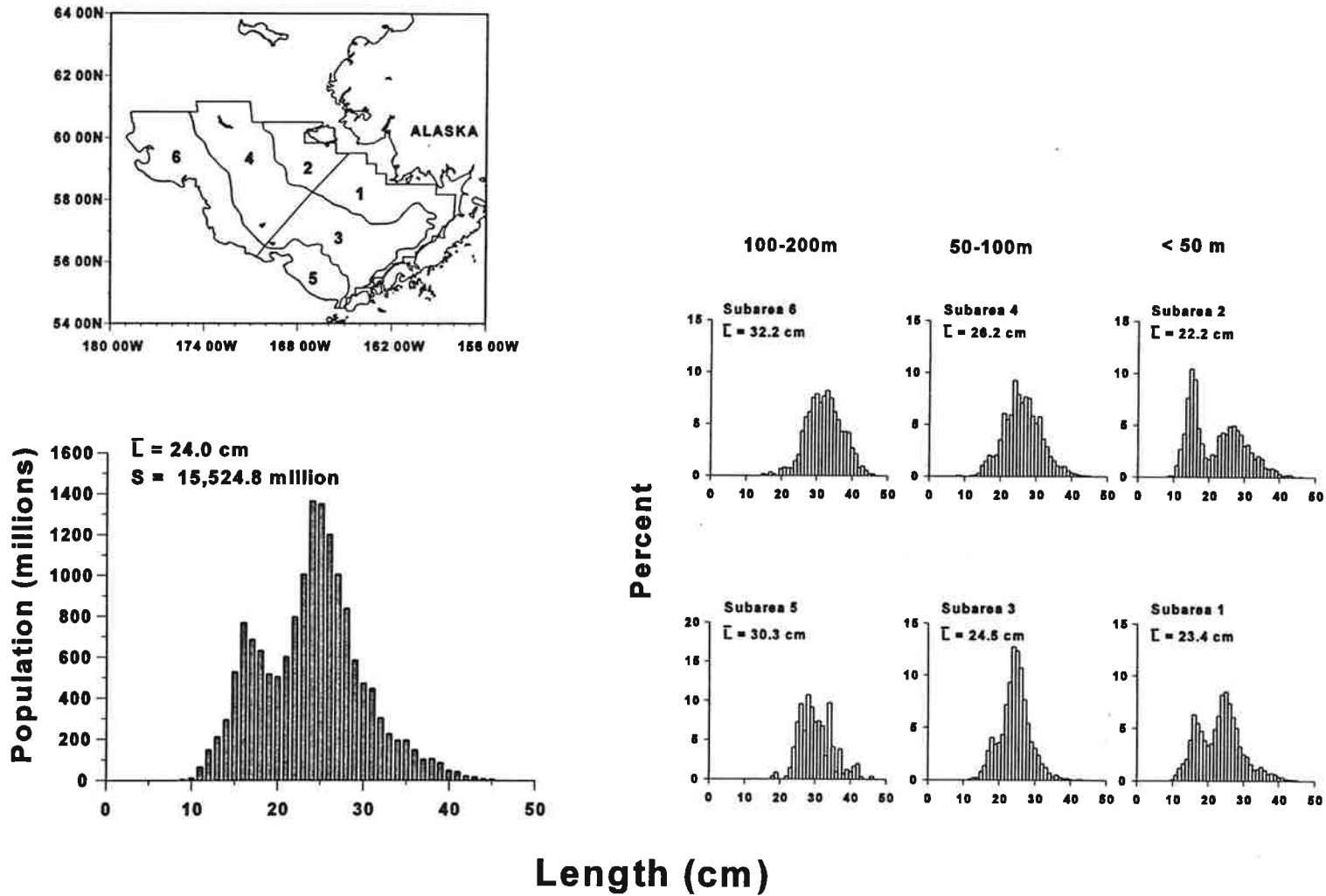


Figure 20.--Estimated relative size distribution (sexes combined) of rock sole in terms of population numbers, and percent for subareas 1-6, 1994 eastern Bering Sea bottom trawl survey.

Table 17.--Estimated population numbers (millions of fish) of rock sole by age group and subarea, 1994 eastern Bering Sea bottom trawl survey.

AGE	YEAR CLASS	6	5	4	3	2	1	ALL SUBAREAS COMBINED	PROPORTION
2	1990	0.00	0.00	0.15	0.00	7.84	36.34	44.33	0.0029
3	1989	0.02	0.00	8.79	9.80	126.48	373.44	518.54	0.0334
4	1988	0.74	0.05	114.07	212.16	301.20	1,601.34	2,229.57	0.1436
5	1987	1.31	0.05	150.77	221.23	91.27	920.35	1,384.97	0.0892
6	1986	2.02	0.24	166.18	295.84	72.91	857.67	1,394.86	0.0898
7	1985	18.38	2.26	632.45	1,145.48	195.55	2,634.74	4,628.86	0.2982
8	1984	22.03	2.36	346.48	452.59	135.13	1,327.77	2,286.35	0.1473
9	1983	20.04	1.70	205.31	202.79	83.96	584.17	1,097.96	0.0707
10	1982	7.91	0.49	73.49	56.62	28.27	188.73	355.53	0.0229
11	1981	21.24	1.33	152.17	100.06	56.48	346.67	677.96	0.0437
12	1980	13.71	0.55	64.66	34.91	26.16	161.64	301.62	0.0194
13	1979	10.02	0.61	41.89	19.02	15.67	83.87	171.07	0.0110
14	1978	15.47	0.47	46.96	21.85	14.53	95.22	194.50	0.0125
15	1977	6.30	0.21	22.28	11.49	7.48	44.00	91.75	0.0059
16	1976	4.90	0.29	11.73	5.07	4.99	29.18	56.15	0.0036
17	1975	1.21	0.05	3.02	1.83	1.16	6.53	13.79	0.0009
18	1974	0.91	0.05	1.44	0.18	0.36	8.82	11.74	0.0008
19	1973	2.45	0.04	5.40	2.65	2.91	16.30	29.75	0.0019
24	1968	0.76	0.02	1.43	0.43	0.94	7.12	10.69	0.0007
25	1967	0.45	0.03	0.72	0.09	0.18	4.41	5.87	0.0004
Age Unknown		1.53	0.11	2.51	0.26	2.38	12.09	18.88	0.0012
All Ages Combined		151.40	10.92	2,051.91	2,794.33	1,175.84	9,340.37	15,524.77	1.0000

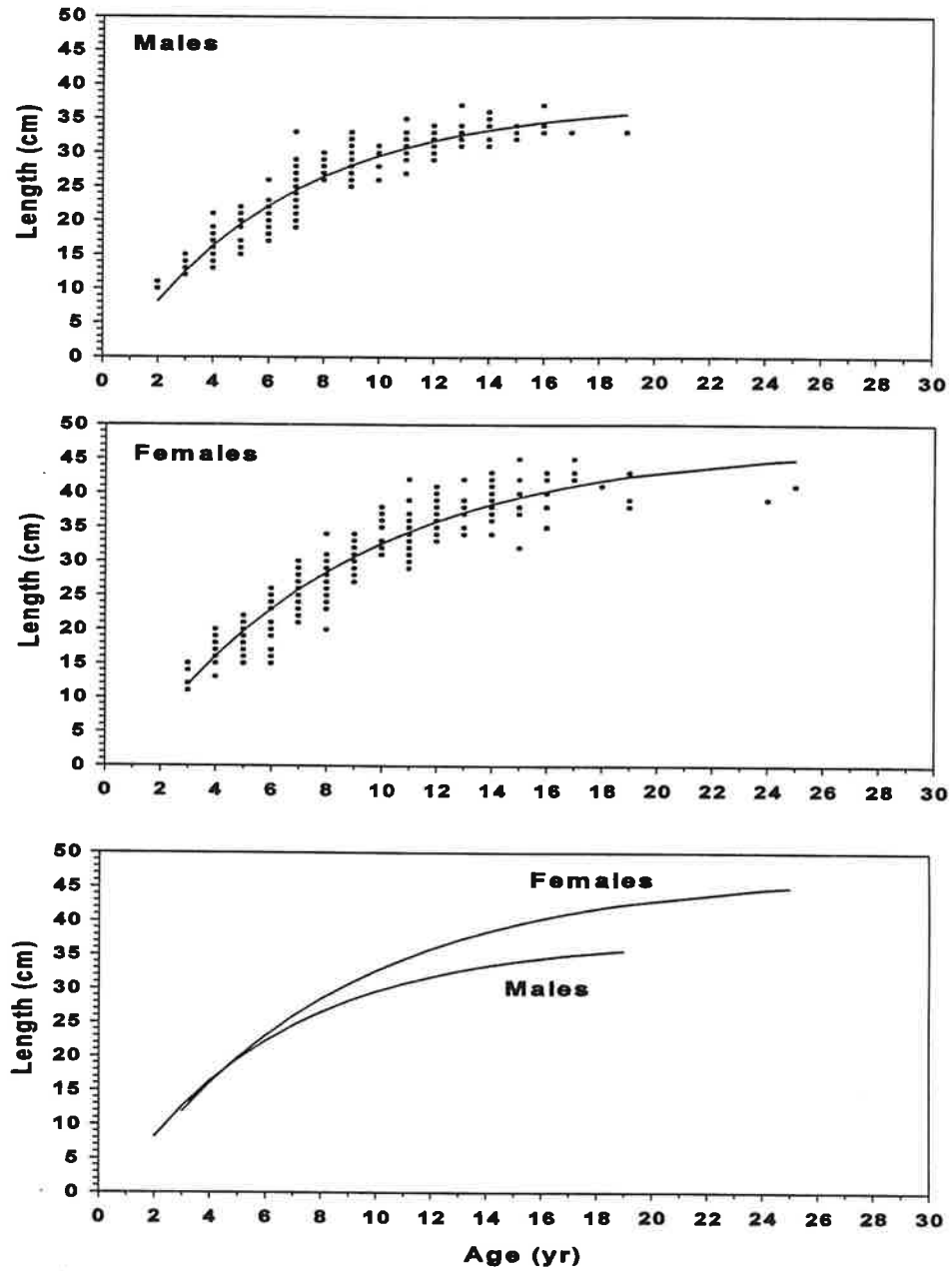


Figure 21.--Distribution of rock sole aged samples from the 1994 eastern Bering Sea bottom trawl survey by length for males, females, and compared showing non-linear von-Bertalanffy estimates.

Table 18.--von-Bertalanffy growth parameter estimates for rock sole by sex, based on otolith age reading and length data from the 1994 eastern Bering Sea bottom trawl survey.

Sex	Number of age readings	Age range (years)	Length range (cm)	Parameters		
				$L_{inf}$	K	$t_0$
Male	196	2-19	10-37	37.4	0.16	0.50
Female	270	3-25	11-45	47.1	0.13	0.71

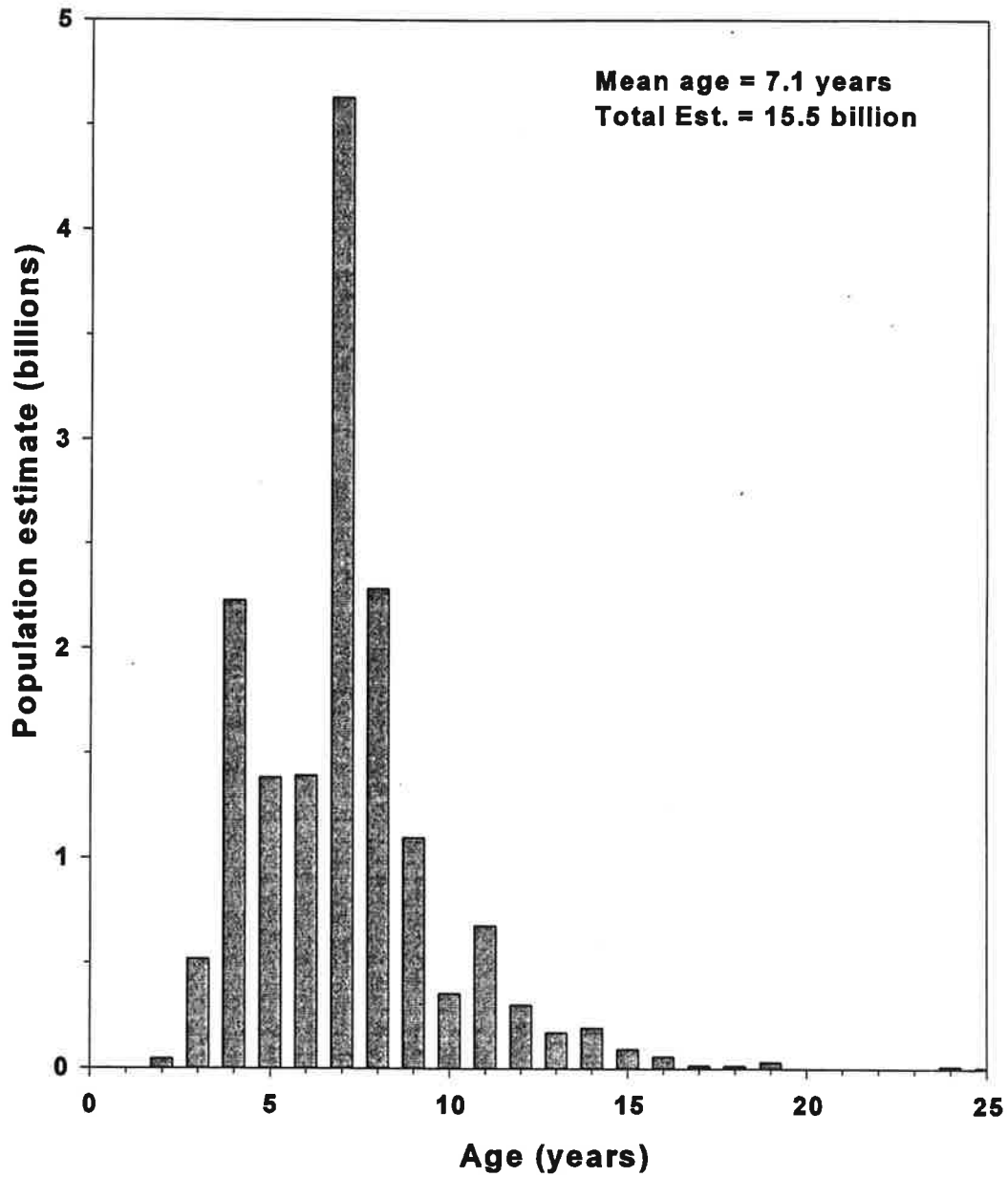


Figure 22.--Population number estimates by age for rock sole, 1994 eastern Bering Sea bottom trawl survey.



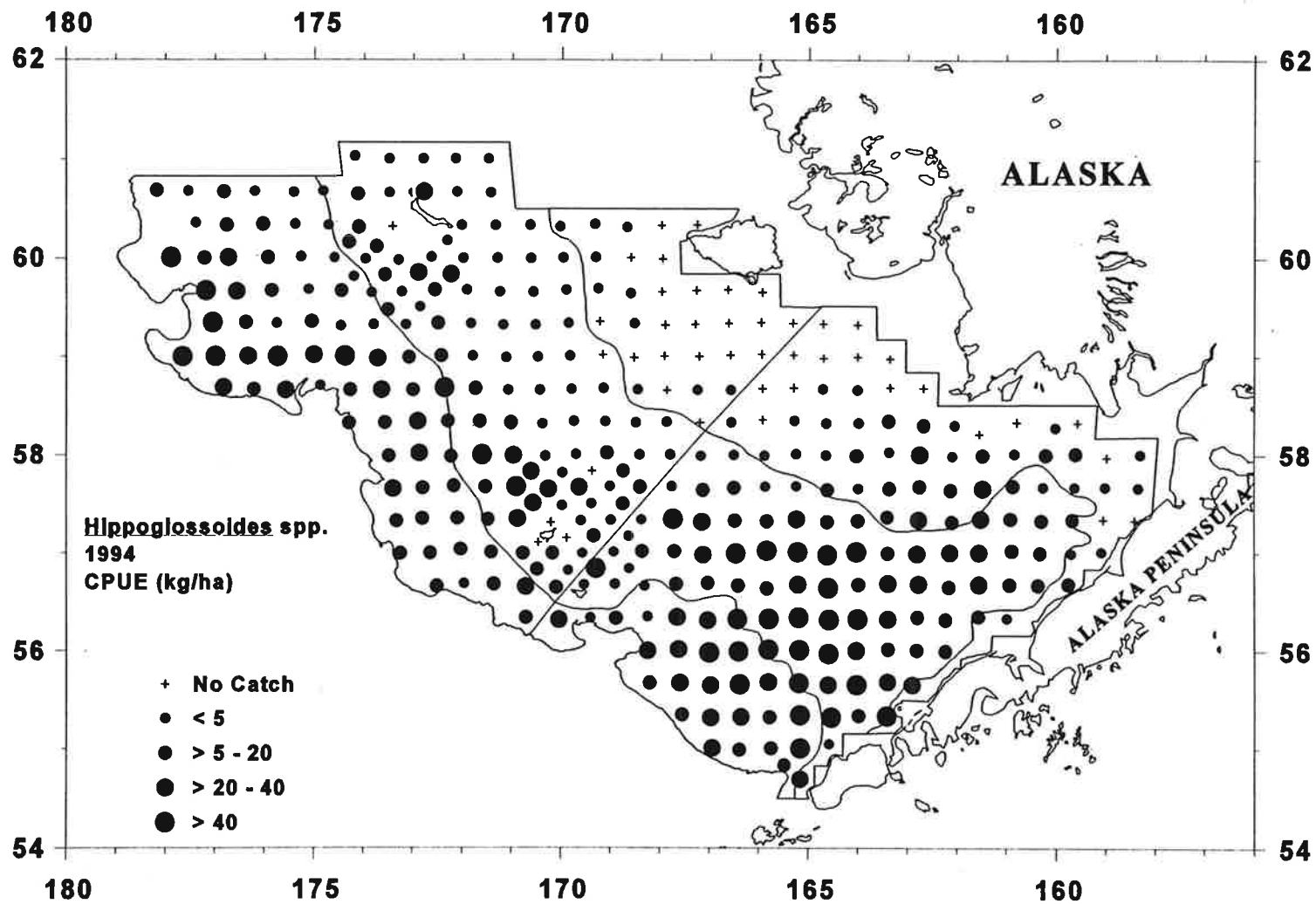


Figure 23.--Distribution and relative abundance in kg/ha of *Hippoglossoides* spp., 1994 eastern Bering Sea bottom trawl survey.

Table 19.--Abundance estimates and mean size of Hippoglossoides spp. by subarea, 1994 eastern Bering Sea bottom trawl survey.

Subarea	Mean CPUE (kg/ha)	Estimated biomass (t) <sup>a</sup>	Proportion of estimated biomass	Estimated population numbers <sup>a</sup>	Proportion of estimated population	Mean Size Weight (kg)	Mean Size Length (cm)
1	5.09	39,675	0.055	83,548,032	0.032	0.475	34.9
2	0.12	481	0.001	980,182	0.000	0.491	32.9
3	32.87	339,499	0.467	940,609,818	0.364	0.361	32.0
4	6.22	67,057	0.092	206,035,914	0.080	0.325	29.8
5	26.50	102,782	0.142	599,250,966	0.232	0.172	25.5
6	18.69	176,717	0.243	753,742,489	0.292	0.234	26.8
All subareas combined <sup>b</sup>	15.67	726,212	1.000	2,584,167,401	1.000	0.281	28.9
95% Confidence interval		±101,357		±354,186,236			

<sup>a</sup> Variances of abundance estimates are given in Appendix D.

<sup>b</sup> Differences in sums of estimates and totals are due to rounding.

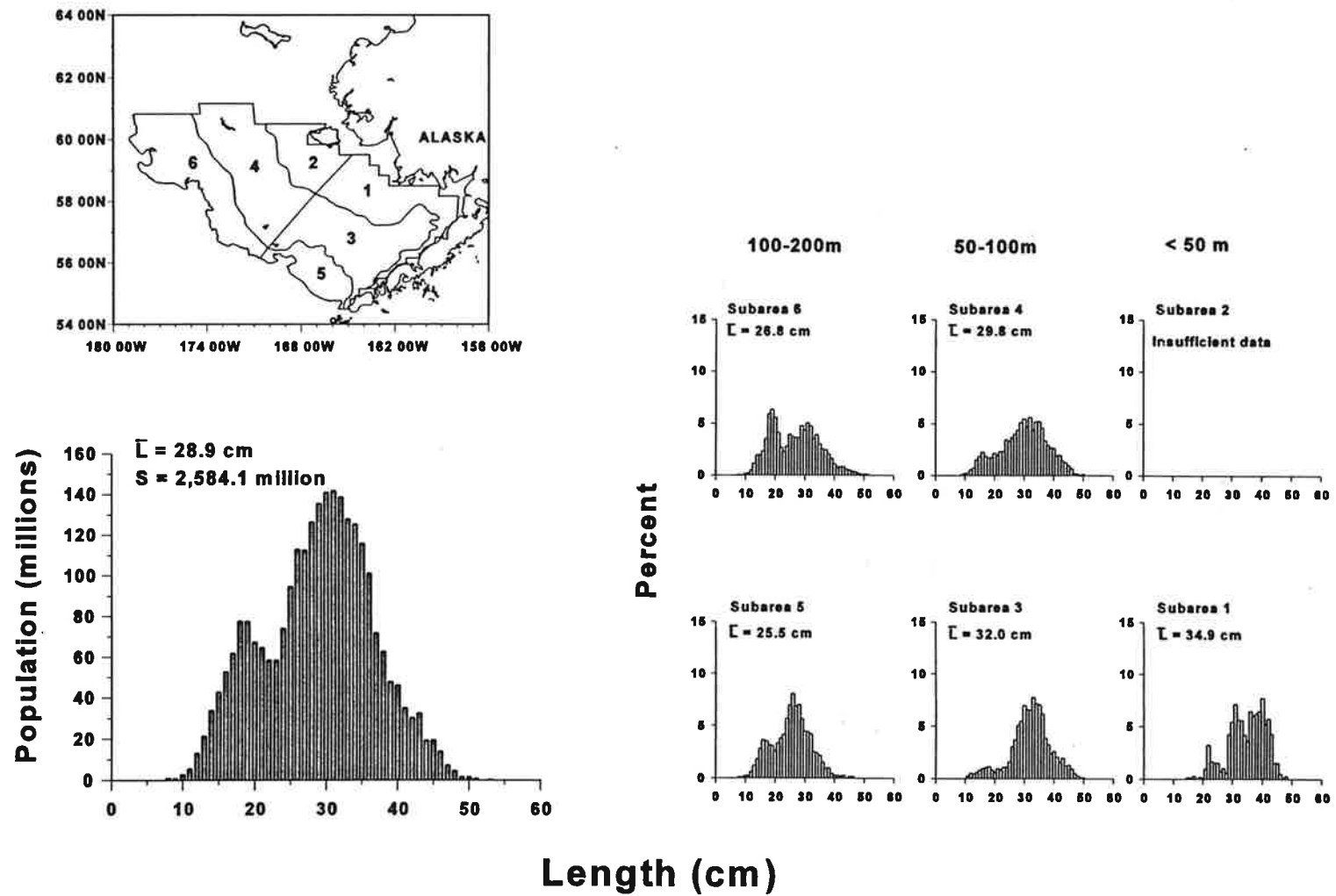


Figure 24.--Estimated relative size distribution (sexes combined) of *Hippoglossoides* spp. in terms of population numbers, and percent for subareas 1-6, 1994 eastern Bering Sea bottom trawl survey.

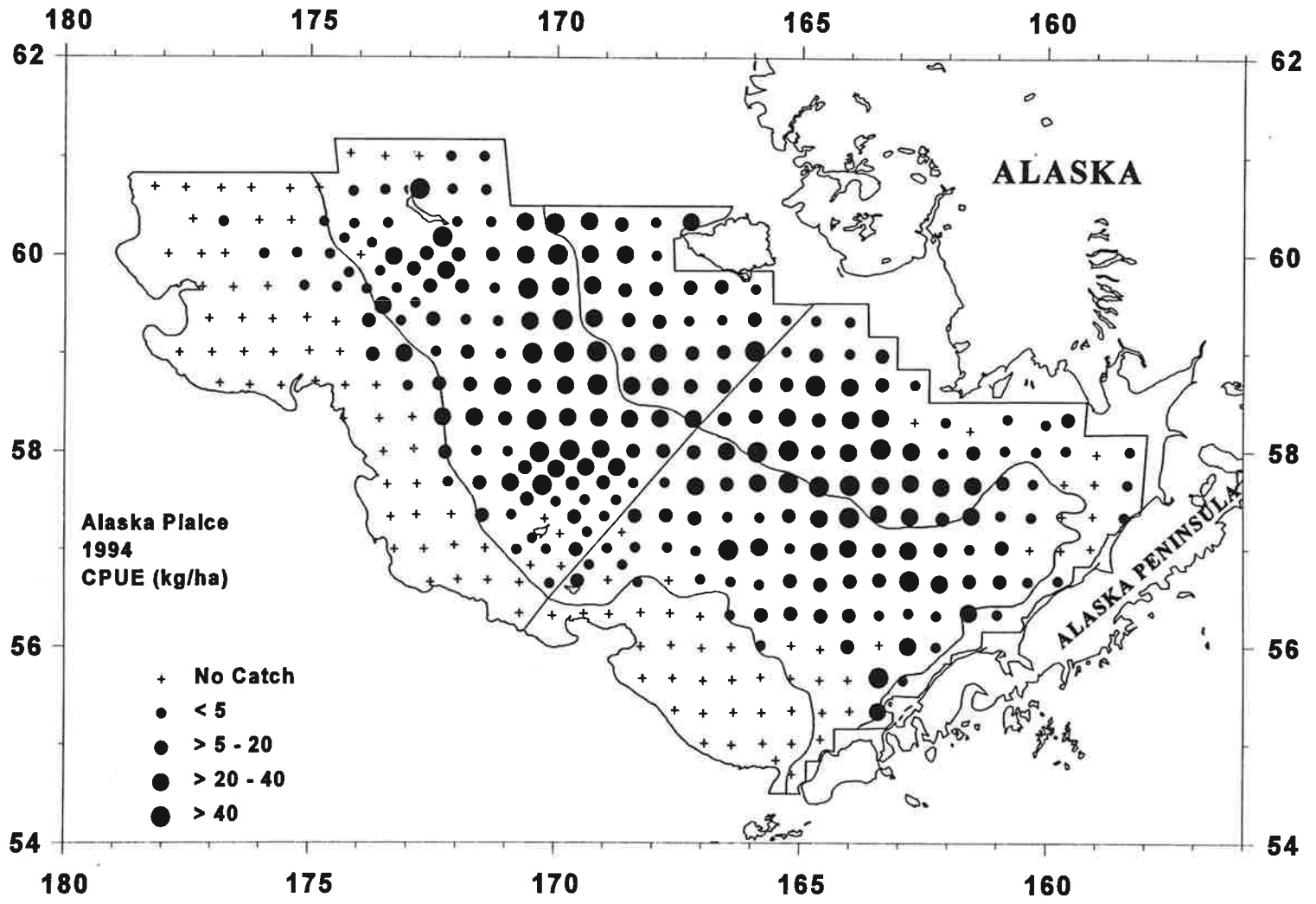


Figure 25.--Distribution and relative abundance in kg/ha of Alaska plaice, 1994 eastern Bering Sea bottom trawl survey.

Table 20.--Abundance estimates and mean size of Alaska plaice by subarea, 1994 eastern Bering Sea bottom trawl survey.

Subarea	Mean CPUE (kg/ha)	Estimated biomass (t) <sup>a</sup>	Proportion of estimated biomass	Estimated population numbers <sup>a</sup>	Proportion of estimated population	Mean Weight (kg)	Mean Size Length (cm)
1	19.06	148,420	0.238	299,837,409	0.297	0.495	33.0
2	18.24	74,813	0.120	199,056,850	0.197	0.376	29.3
3	13.08	135,154	0.217	183,146,437	0.181	0.738	37.8
4	22.98	247,791	0.398	317,187,263	0.314	0.781	38.0
5	0.01	35	0.000	32,315	0.000	1.083	43.0
6	1.78	16,866	0.027	11,744,808	0.012	1.436	44.4
All subareas combined <sup>b</sup>	13.45	623,079	1.000	1,011,005,082	1.000	0.616	34.8
95% Confidence interval		±105,519		±174,204,593			

<sup>a</sup> Variances of abundance estimates are given in Appendix D.

<sup>b</sup> Differences in sums of estimates and totals are due to rounding.

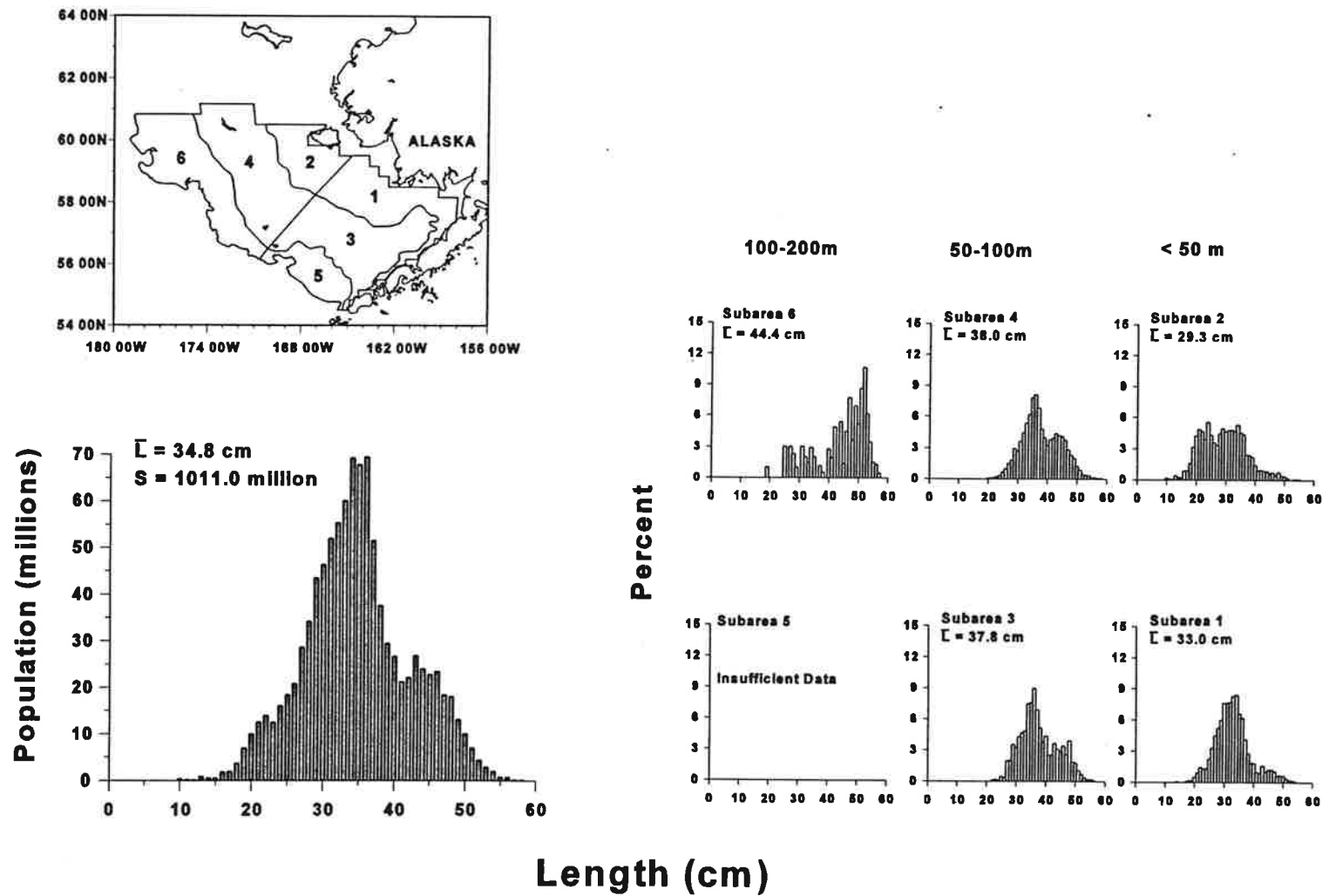


Figure 26 --Estimated relative size distribution (sexes combined) of Alaska plaice in terms of population numbers and percent for subareas 1-6, eastern Bering Sea bottom trawl survey.

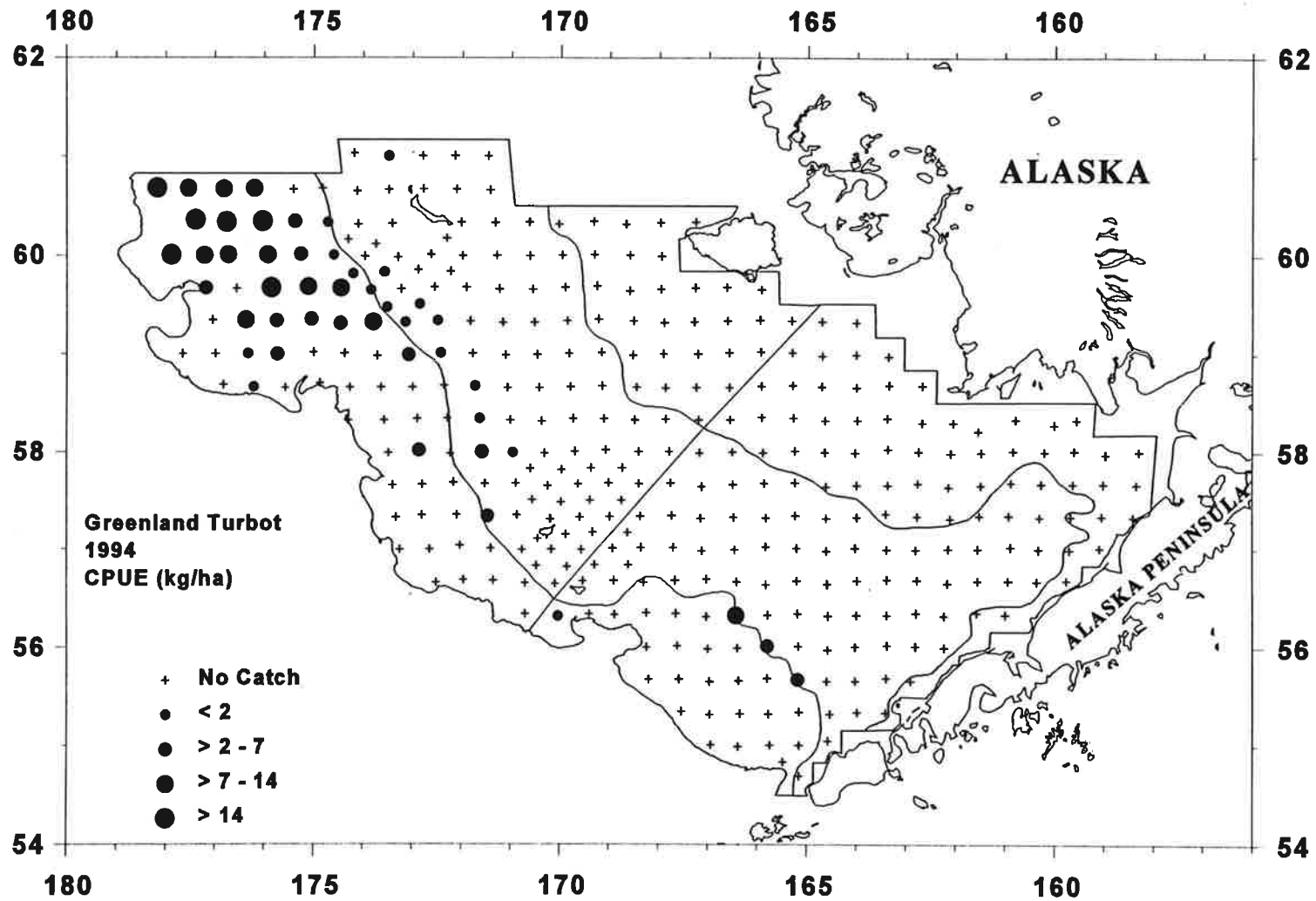


Figure 27.--Distribution and relative abundance in kg/ha of Greenland turbot, 1994 eastern Bering Sea bottom trawl survey.

Table 21.--Abundance estimates and mean size of Greenland turbot by subarea, 1994 eastern Bering Sea bottom trawl survey.

Subarea	Mean CPUE (kg/ha)	Estimated biomass (t) <sup>a</sup>	Proportion of estimated biomass	Estimated population numbers <sup>a</sup>	Proportion of estimated population	Mean Weight (kg)	Mean Size Length (cm)
1	0.00	0	0.000	0	0.000	0.000	0.0
2	0.00	0	0.000	0	0.000	0.000	0.0
3	0.21	2,124	0.044	369,816	0.019	5.743	81.9
4	0.19	2,083	0.043	937,097	0.049	2.223	51.3
5	0.06	216	0.004	31,343	0.002	6.891	87.0
6	4.69	44,347	0.909	17,795,652	0.930	2.492	56.3
All subareas combined <sup>b</sup>	1.05	48,770	1.000	19,133,908	1.000	2.549	56.6
95% Confidence interval		±22,349		±8,046,865			

<sup>a</sup> Variances of abundance estimates are given in Appendix D.

<sup>b</sup> Differences in sums of estimates and totals are due to rounding.



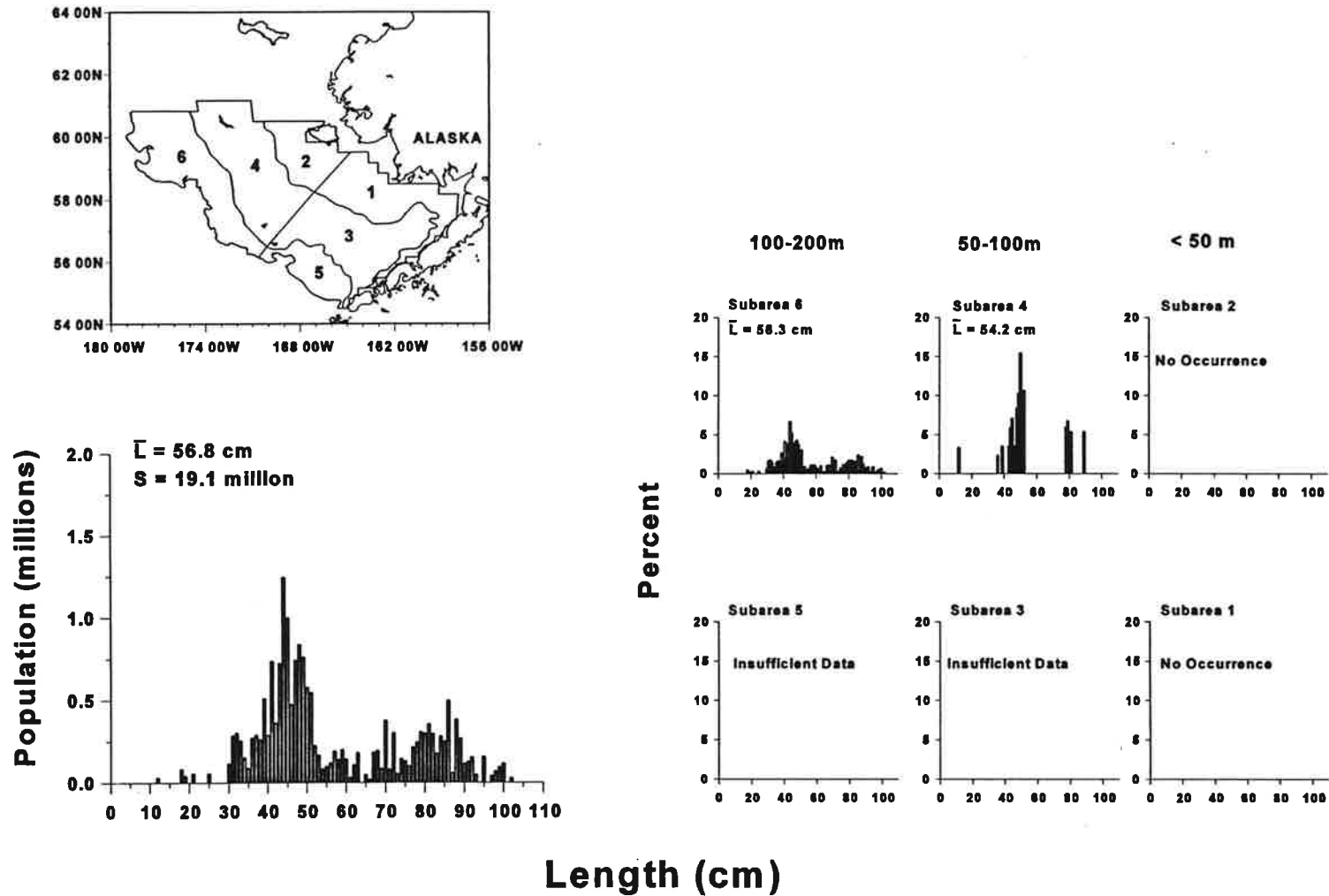


Figure 28.--Estimated relative size distribution (sexes combined) of Greenland turbot in terms of population number and percent for subareas 1-6, 1994 eastern Bering Sea bottom trawl survey.

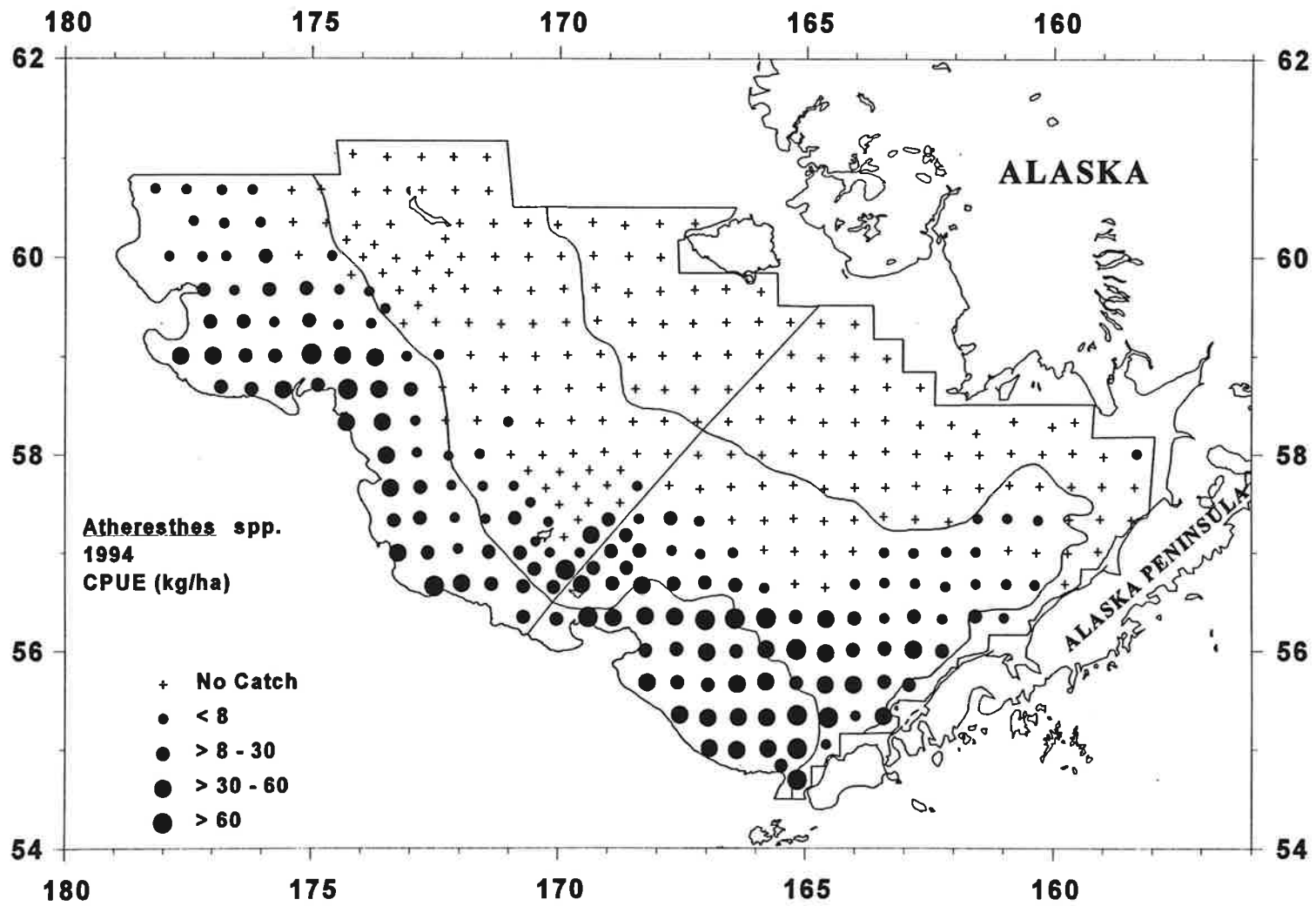


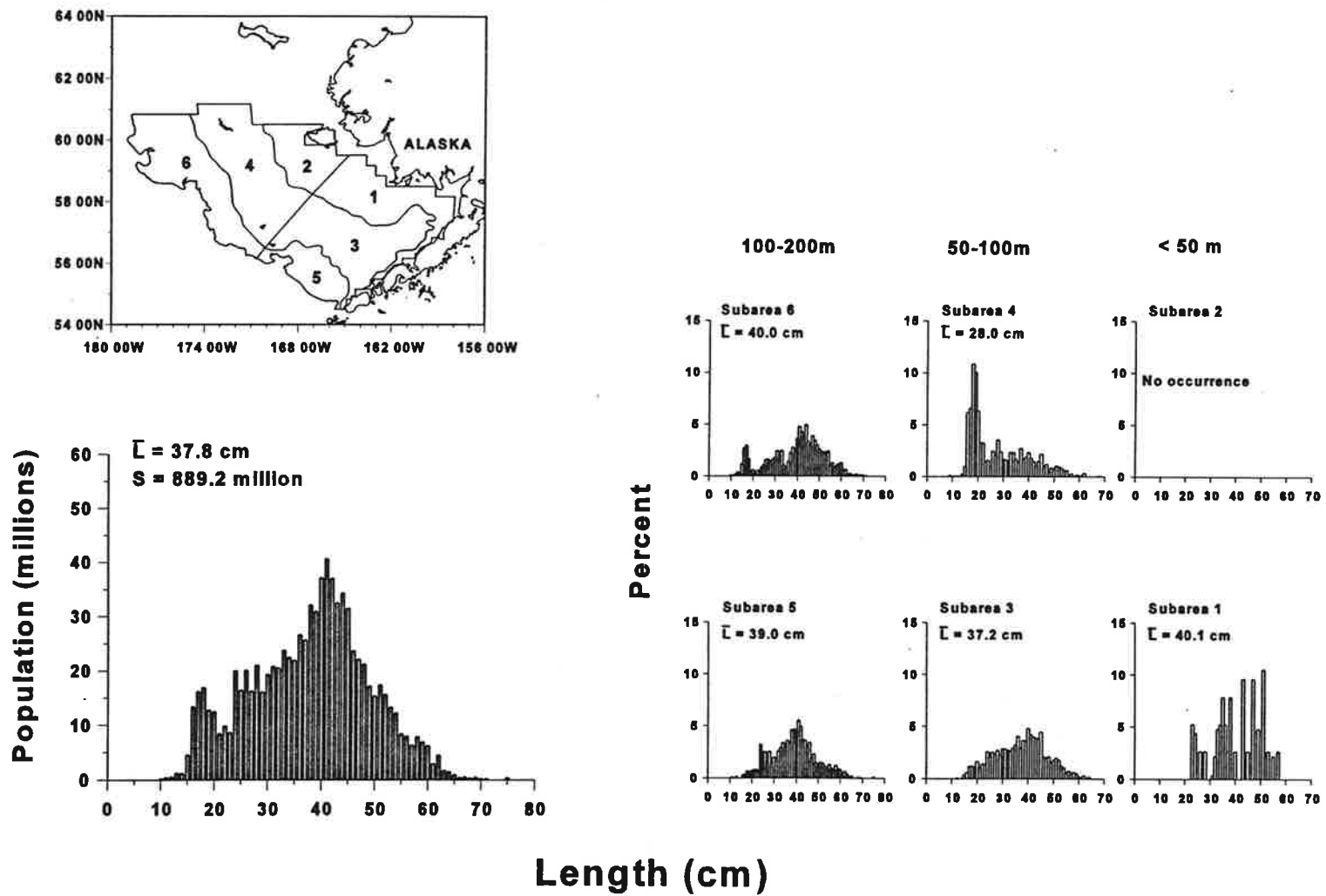
Figure 29.--Distribution and relative abundance in kg/ha of *Atheresthes* spp., 1994 eastern Bering Sea bottom trawl survey.

Table 22.--Abundance estimates and mean size of Atheresthes spp. by subarea, 1994 eastern Bering Sea bottom trawl survey.

Subarea	Mean CPUE (kg/ha)	Estimated biomass (t) <sup>a</sup>	Proportion of estimated biomass	Estimated population numbers <sup>a</sup>	Proportion of estimated population	Mean Weight (kg)	Mean Size Length (cm)
1	0.78	6,082	0.011	8,783,366	0.010	0.692	40.1
2	0.00	0	0.000	0	0.000	0.000	0.0
3	15.72	162,402	0.285	284,103,005	0.320	0.572	37.2
4	2.03	21,841	0.038	69,742,678	0.078	0.313	28.0
5	44.57	172,906	0.303	281,920,094	0.317	0.613	39.0
6	21.93	207,374	0.363	244,636,042	0.275	0.848	40.0
All subareas combined <sup>b</sup>	12.31	570,605	1.000	889,185,185	1.000	0.642	37.8
95% Confidence interval		±103,018		±172,284,656			

<sup>a</sup> Variances of abundance estimates are given in Appendix D.

<sup>b</sup> Differences in sums of estimates and totals are due to rounding.



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Figure 30.--Estimated relative size distribution (sexes combined) of *Atheresthes* spp. in terms of population numbers and percent for subareas 1-6, 1994 Bering Sea bottom trawl survey.

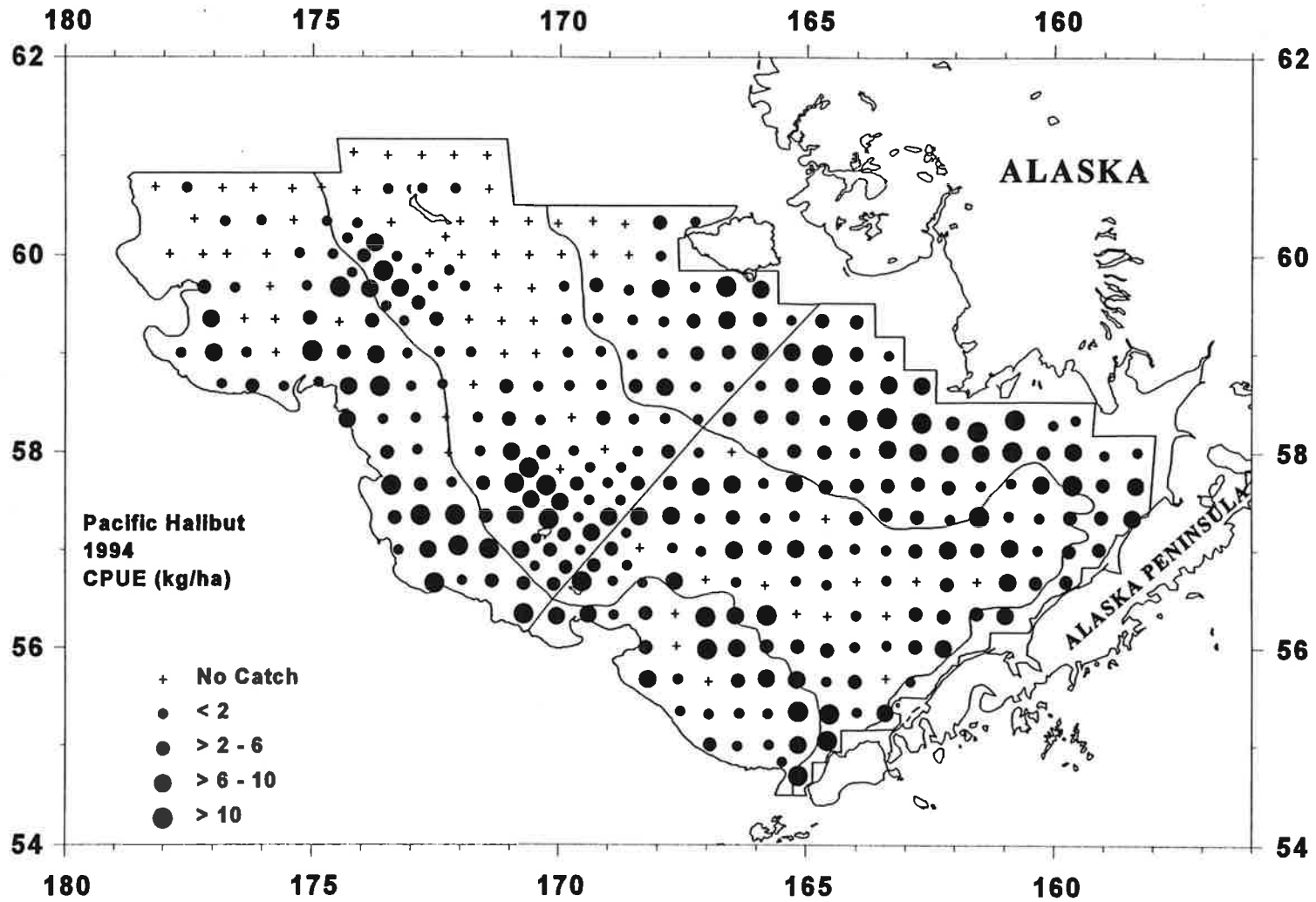


Figure 31.-- Distribution and relative abundance in kg/ha of Pacific halibut, 1994 eastern Bering Sea bottom trawl survey.

Table 23.--Abundance estimates and mean size of Pacific halibut by subarea, 1994 eastern Bering Sea bottom trawl survey.

Subarea	Mean CPUE (kg/ha)	Estimated biomass (t) <sup>a</sup>	Proportion of estimated biomass	Estimated population numbers <sup>a</sup>	Proportion of estimated population	Mean Size Weight (kg)	Mean Size Length (cm)
1	5.57	43,400	0.266	15,419,558	0.311	2.815	58.0
2	2.49	10,214	0.063	4,068,473	0.082	2.511	57.4
3	3.93	40,617	0.249	11,623,402	0.235	3.494	62.0
4	1.86	20,087	0.123	9,160,825	0.185	2.193	56.5
5	3.88	15,055	0.092	2,475,416	0.050	6.082	75.1
6	3.59	33,956	0.208	6,773,614	0.137	5.013	69.8
All subareas combined <sup>b</sup>	3.53	163,330	1.000	49,521,288	1.000	3.298	61.1
95% Confidence interval		±22,051		±8,142,793			

<sup>a</sup> Variances of abundance estimates are given in Appendix D.

<sup>b</sup> Differences in sums of estimates and totals are due to rounding.

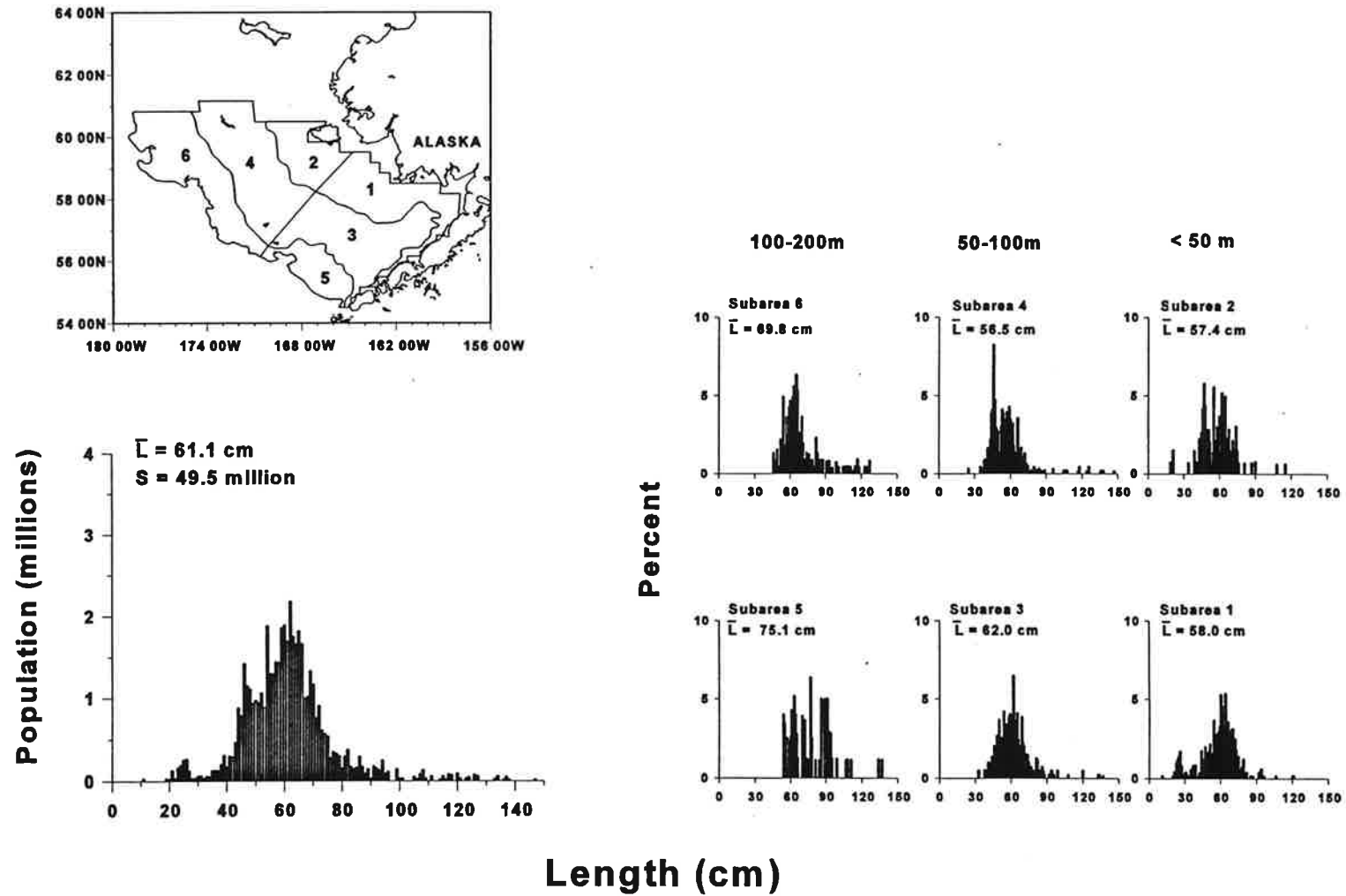


Figure 32.--Estimated relative size distribution (sexes combined) of Pacific halibut in terms of population numbers and percent for subareas 1-6, 1994 eastern Bering Sea bottom trawl survey.

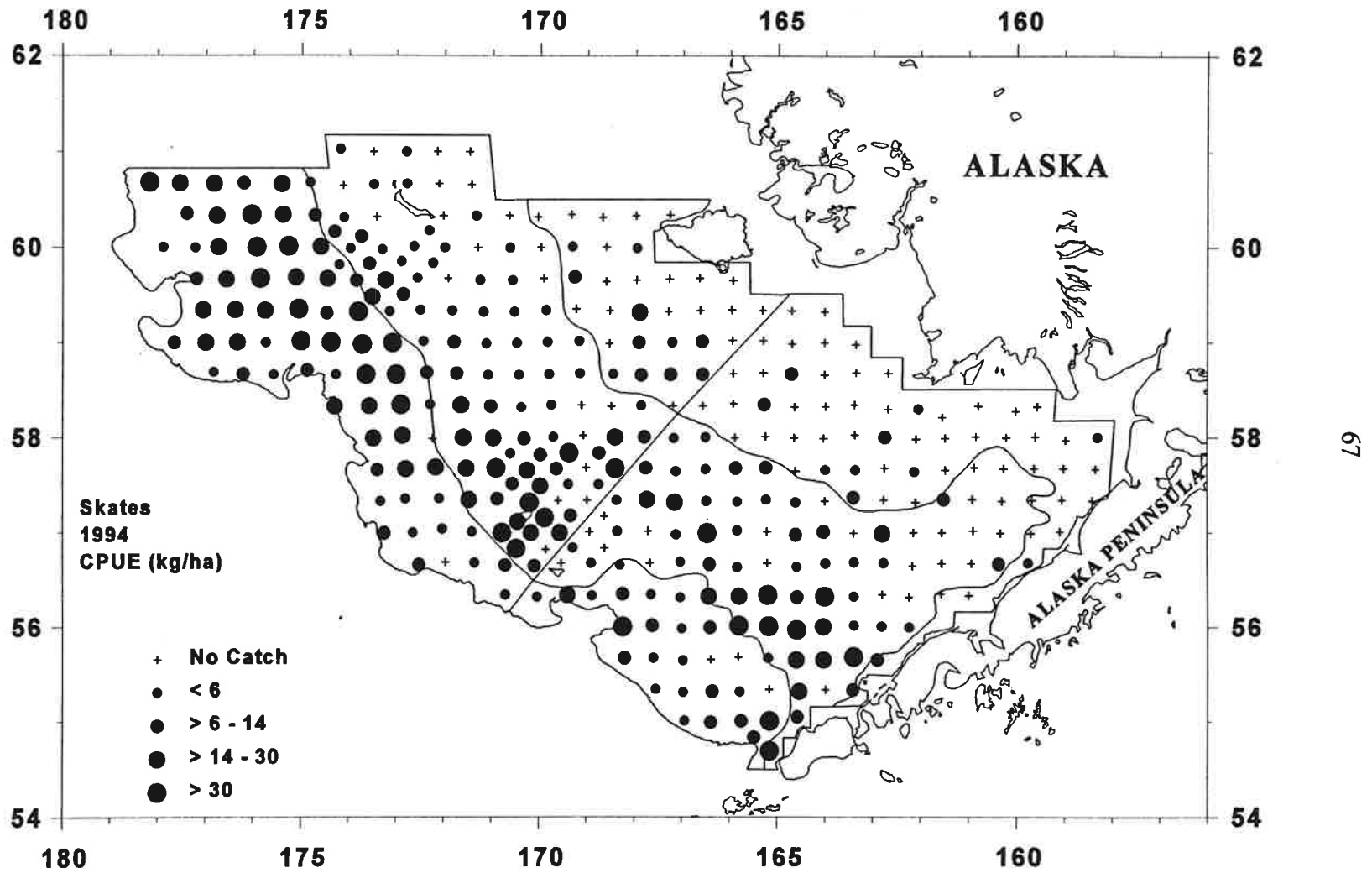


Figure 33.--Distribution and relative abundance in kg/ha of skates, 1994 eastern Bering Sea bottom trawl survey.



Table 24.--Abundance estimates and mean size of skates by subarea, 1994 eastern Bering Sea bottom trawl survey.

Subarea	Mean CPUE (kg/ha)	Estimated biomass (t) <sup>a</sup>	Proportion of estimated biomass	Estimated population numbers <sup>a</sup>	Proportion of estimated population	Mean Weight (kg)
1	1.17	9,082	0.022	2,150,058	0.022	4.224
2	2.49	10,223	0.025	1,658,397	0.017	6.164
3	9.43	97,436	0.235	26,610,212	0.273	3.662
4	7.30	78,686	0.190	18,160,162	0.186	4.333
5	11.13	43,185	0.104	9,817,948	0.101	4.399
6	18.57	175,622	0.424	39,217,755	0.402	4.478
All subareas combined <sup>b</sup>	8.94	414,235	1.000	97,614,532	1.000	4.244
95% Confidence interval		±64,473		±13,424,789		

<sup>a</sup> Variances of abundance estimates are given in Appendix D.

<sup>b</sup> Differences in sums of estimates and totals are due to rounding.

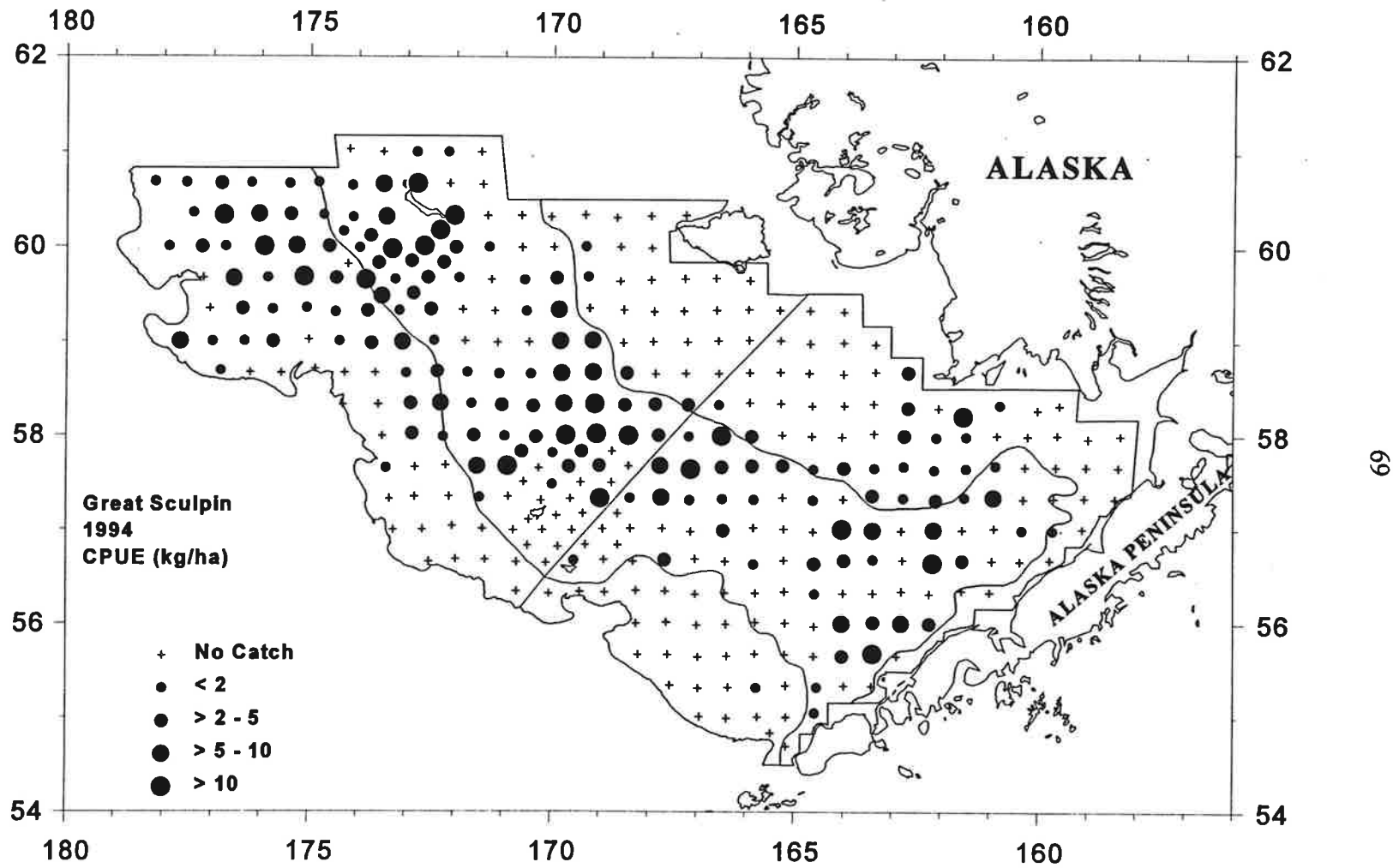


Figure 34.--Distribution and relative abundance in kg/ha of Myoxocephalus polyacanthocephalus, 1994 eastern Bering Sea bottom trawl survey.

Table 25.--Abundance estimates and mean size of great sculpin by subarea, 1994 eastern Bering Sea bottom trawl survey.

Subarea	Mean CPUE (kg/ha)	Estimated biomass (t) <sup>a</sup>	Proportion of estimated biomass	Estimated population numbers <sup>a</sup>	Proportion of estimated population	Mean Weight (kg)
1	0.92	7,127	0.075	9,655,566	0.142	0.738
2	0.21	859	0.009	1,061,980	0.016	0.809
3	2.30	23,805	0.251	11,263,760	0.166	2.113
4	3.53	38,090	0.402	33,251,040	0.489	1.146
5	0.01	59	0.001	29,063	0.000	2.030
6	2.63	24,886	0.262	12,718,856	0.187	1.957
All subareas combined <sup>b</sup>	2.05	94,826	1.000	67,980,265	1.000	1.395
95% Confidence interval		±20,106		±15,658,150		

<sup>a</sup> Variances of abundance estimates are given in Appendix D.

<sup>b</sup> Differences in sums of estimates and totals are due to rounding.

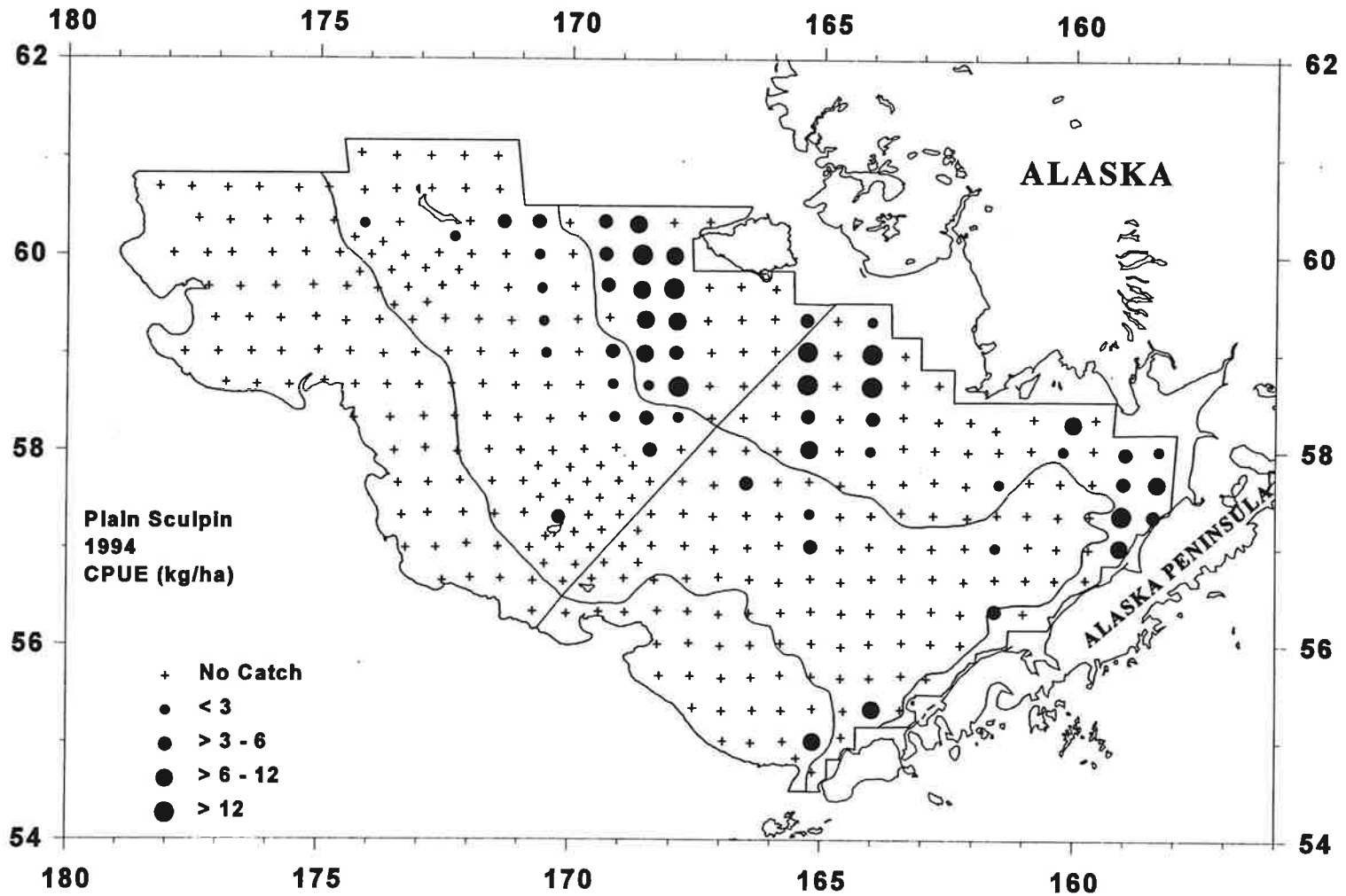


Figure 35.--Distribution and relative abundance in kg/ha of Myoxocephalus jaok, 1994 eastern Bering Sea bottom trawl survey.

Table 26.--Abundance estimates and mean size of plain sculpin by subarea, 1994 eastern Bering Sea bottom trawl survey.

Subarea	Mean CPUE (kg/ha)	Estimated biomass (t) <sup>a</sup>	Proportion of estimated biomass	Estimated population numbers <sup>a</sup>	Proportion of estimated population	Mean Weight (kg)
1	2.44	19,012	0.429	31,877,735	0.478	0.596
2	4.19	17,182	0.388	28,812,375	0.432	0.596
3	0.27	2,795	0.063	1,724,016	0.026	1.621
4	0.39	4,225	0.095	4,076,249	0.061	1.036
5	0.28	1,105	0.025	254,131	0.004	4.348
6	0.00	0	0.000	0	0.000	0.000
All subareas combined <sup>b</sup>	0.96	44,319	1.000	66,744,506	1.000	0.664
95% Confidence interval		±13,535		±22,891,340		

<sup>a</sup> Variances of abundance estimates are given in Appendix D.

<sup>b</sup> Differences in sums of estimates and totals are due to rounding.

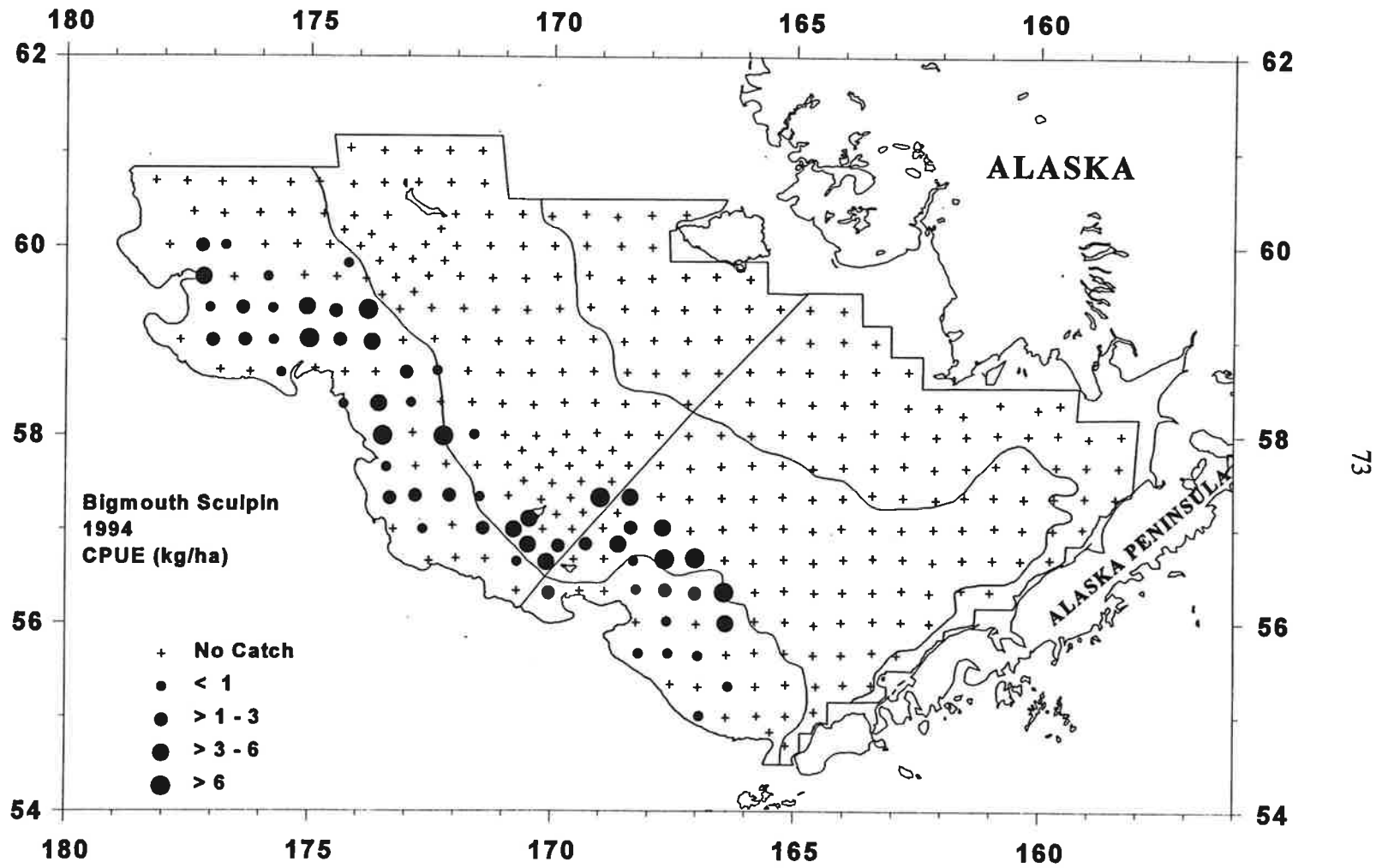


Figure 36.--Distribution and relative abundance in kg/ha of bigmouth sculpin, 1994 eastern Bering Sea bottom trawl survey.

Table 27.--Abundance estimates and mean size of bigmouth sculpin by subarea, 1994 eastern Bering Sea bottom trawl survey.

Subarea	Mean CPUE (kg/ha)	Estimated biomass (t) <sup>a</sup>	Proportion of estimated biomass	Estimated population numbers <sup>a</sup>	Proportion of estimated population	Mean Weight (kg)
1	0.00	0	0.000	0	0.000	0.000
2	0.00	0	0.000	0	0.000	0.000
3	0.64	6,624	0.234	1,642,806	0.198	4.032
4	0.49	5,249	0.185	1,268,444	0.153	4.138
5	0.60	2,341	0.083	832,013	0.100	2.814
6	1.49	14,115	0.498	4,570,285	0.550	3.088
All subareas combined <sup>b</sup>	0.61	28,330	1.000	8,313,548	1.000	3.408
95% Confidence interval		±12,175		±2,736,809		

<sup>a</sup> Variances of abundance estimates are given in Appendix D.

<sup>b</sup> Differences in sums of estimates and totals are due to rounding.

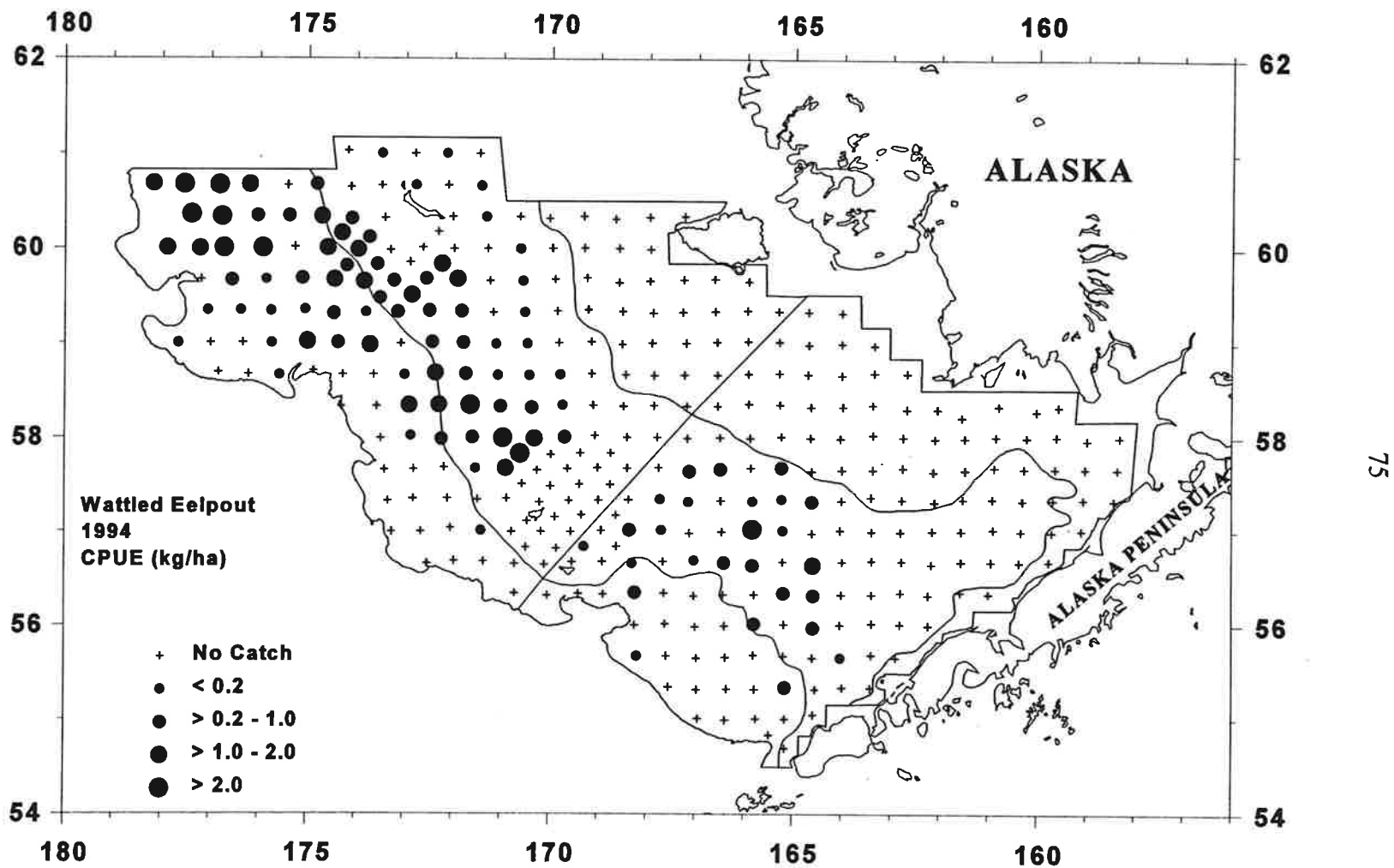


Figure 37.--Distribution and relative abundance in kg/ha of wattle eelpout, 1994 eastern Bering Sea bottom trawl survey.



Table 28.--Abundance estimates and mean size of wattled eelpout by subarea, 1994 eastern Bering Sea bottom trawl survey.

Subarea	Mean CPUE (kg/ha)	Estimated biomass (t) <sup>a</sup>	Proportion of estimated biomass	Estimated population numbers <sup>a</sup>	Proportion of estimated population	Mean Weight (kg)
1	0.00	0	0.000	0	0.000	0.000
2	0.00	0	0.000	0	0.000	0.000
3	0.13	1,312	0.105	6,258,852	0.099	0.210
4	0.28	3,006	0.241	15,864,972	0.251	0.189
5	0.06	232	0.019	623,744	0.010	0.372
6	0.84	7,903	0.635	40,398,899	0.640	0.196
All subareas combined <sup>b</sup>	0.27	12,454	1.000	63,146,467	1.000	0.197
95% Confidence interval		±5,009		±23,018,427		

<sup>a</sup> Variances of abundance estimates are given in Appendix D.

<sup>b</sup> Differences in sums of estimates and totals are due to rounding.

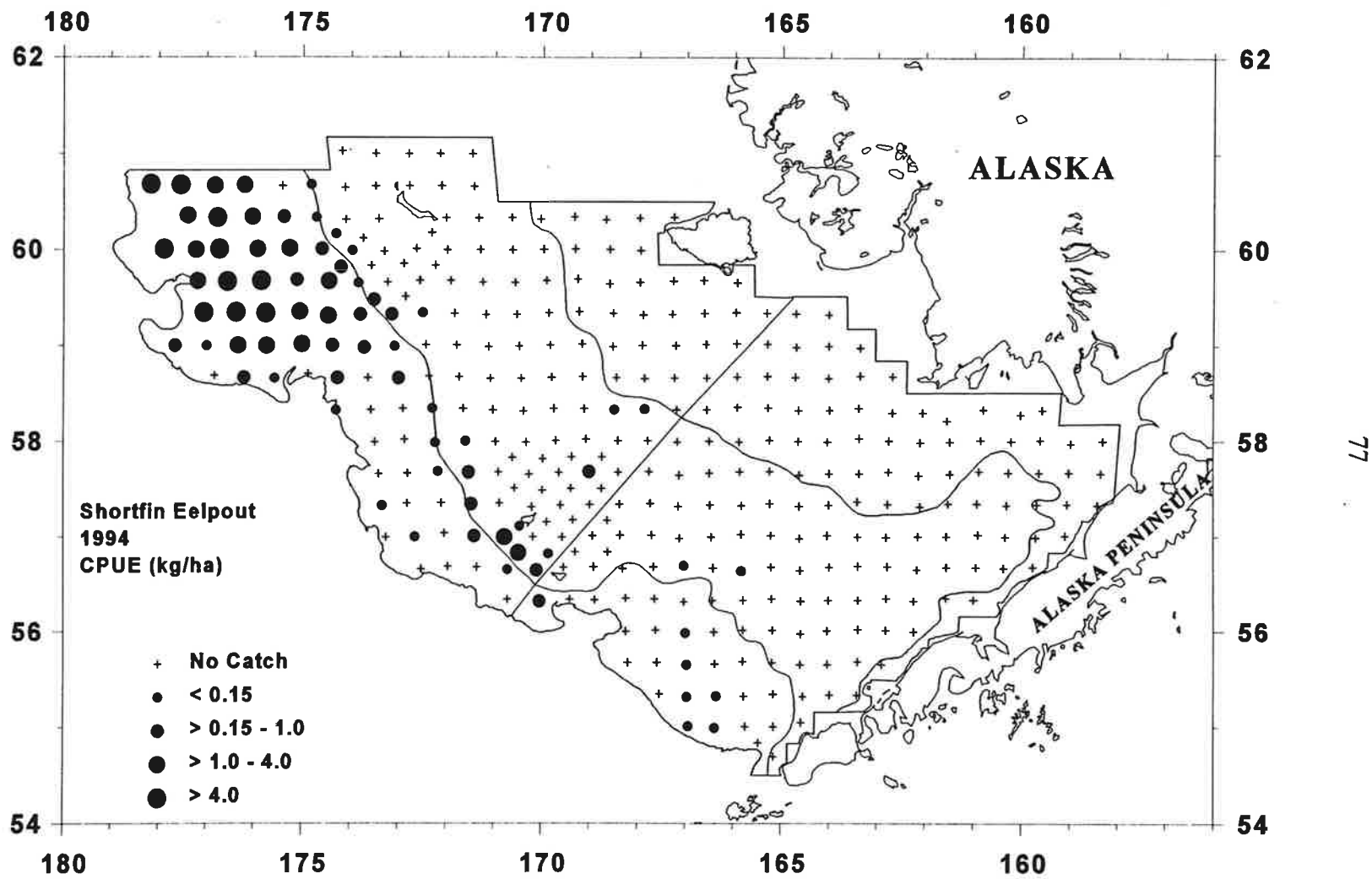


Figure 38.--Distribution and relative abundance in kg/ha of shortfin eelpout, 1994 eastern Bering Sea bottom trawl survey.

Table 29.--Abundance estimates and mean size of shortfin eelpout by subarea, 1994 eastern Bering Sea bottom trawl survey.

Subarea	Mean CPUE (kg/ha)	Estimated biomass (t) <sup>a</sup>	Proportion of estimated biomass	Estimated population numbers <sup>a</sup>	Proportion of estimated population	Mean Weight (kg)
1	0.00	0	0.000	0	0.000	0.000
2	0.00	0	0.000	0	0.000	0.000
3	0.00	11	0.001	138,192	0.000	0.080
4	0.05	580	0.032	10,469,864	0.031	0.055
5	0.04	168	0.009	3,647,653	0.011	0.046
6	1.86	17,623	0.959	321,107,848	0.957	0.055
All subareas combined <sup>b</sup>	0.40	18,382	1.000	335,363,558	1.000	0.055
95% Confidence interval		±9,296		±193,492,447		

<sup>a</sup> Variances of abundance estimates are given in Appendix D.

<sup>b</sup> Differences in sums of estimates and totals are due to rounding.

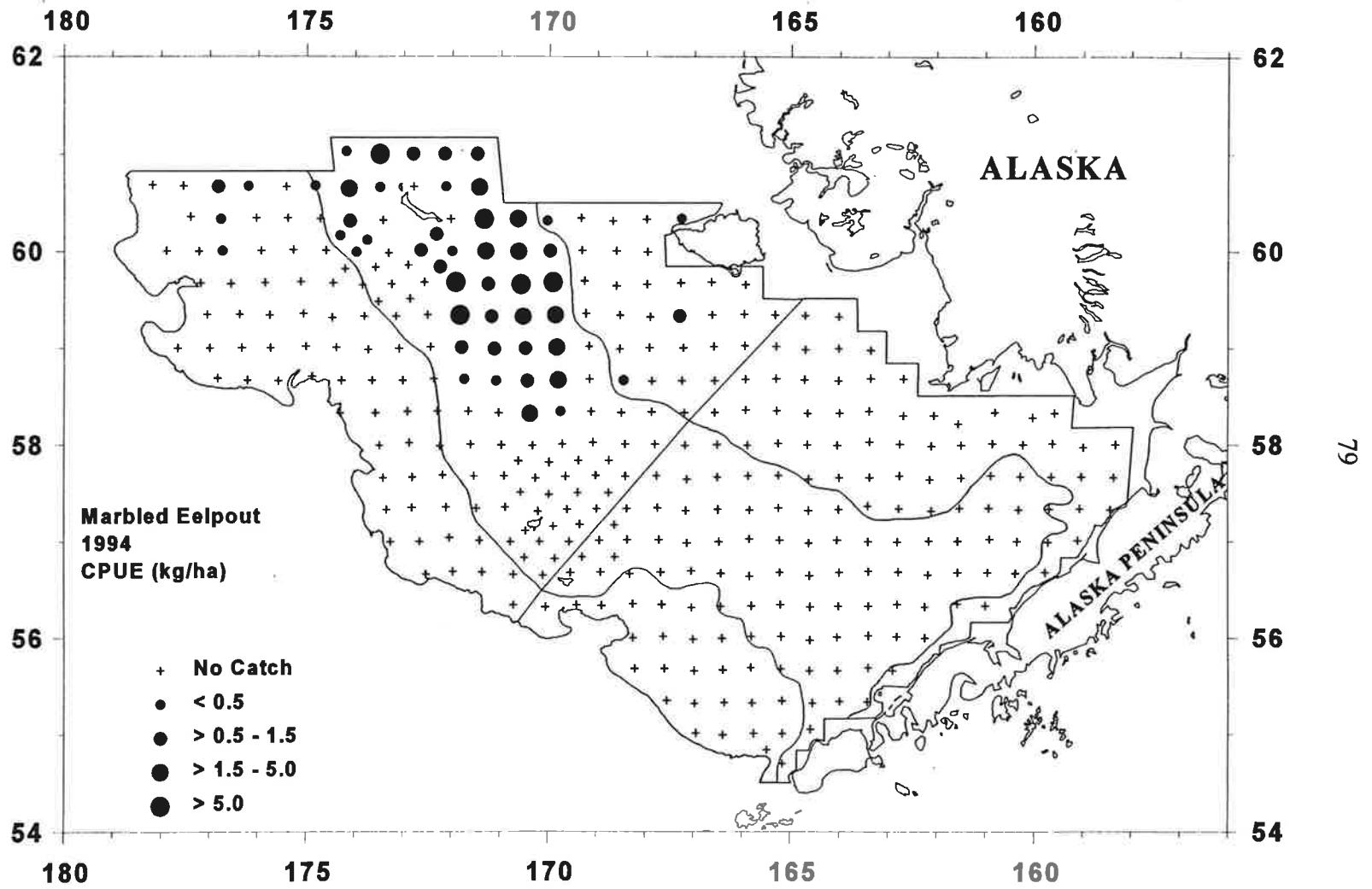


Figure 39.--Distribution and relative abundance in kg/ha of marbled eelpout, 1994 eastern Bering Sea bottom trawl survey.

Table 30.--Abundance estimates and mean size of marbled eelpout by subarea, 1994 eastern Bering Sea bottom trawl survey.

Subarea	Mean CPUE (kg/ha)	Estimated biomass (t) <sup>a</sup>	Proportion of estimated biomass	Estimated population numbers <sup>b</sup>	Proportion of estimated population	Mean Weight (kg)
1	0.00	0	0.000	0	0.000	0.000
2	0.06	241	0.017	262,110	0.016	0.919
3	0.00	0	0.000	0	0.000	0.000
4	1.25	13,445	0.962	15,706,680	0.967	0.856
5	0.00	0	0.000	0	0.000	0.000
6	0.03	282	0.020	274,152	0.017	1.029
All subareas combined <sup>b</sup>	0.30	13,969	1.000	16,242,941	1.000	0.860
95% Confidence interval		±6,302		±6,726,261		

<sup>a</sup> Variances of abundance estimates are given in Appendix D.

<sup>b</sup> Differences in sums of estimates and totals are due to rounding.

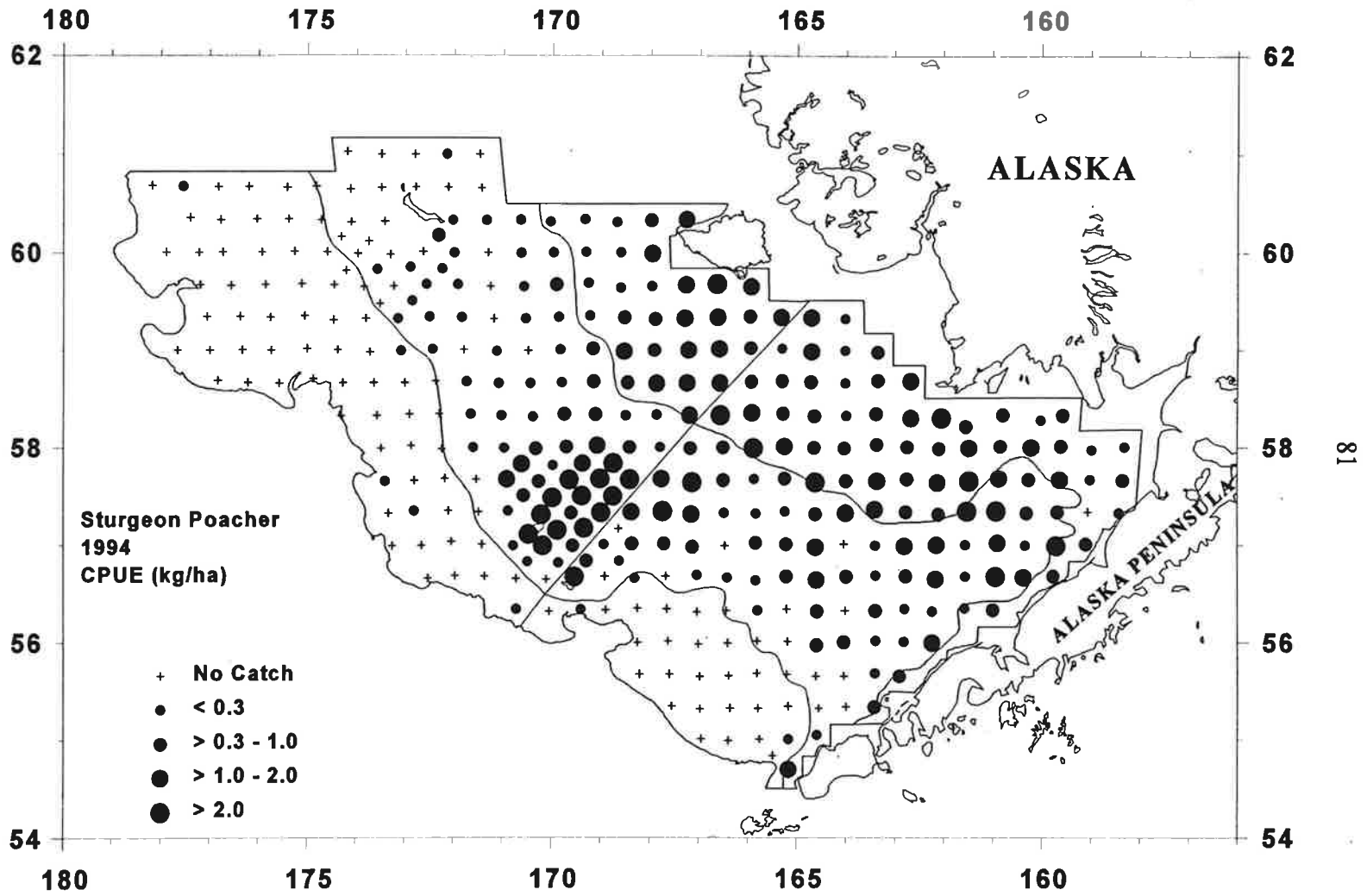


Figure 40.--Distribution and relative abundance in kg/ha of sturgeon poacher, 1994 eastern Bering Sea bottom trawl survey.

Table 31.--Abundance estimates and mean size of sturgeon poacher by subarea, 1994 eastern Bering Sea bottom trawl survey.

Subarea	Mean CPUE (kg/ha)	Estimated biomass (t) <sup>a</sup>	Proportion of estimated biomass	Estimated population numbers <sup>a</sup>	Proportion of estimated population	Mean Weight (kg)
1	0.98	7,645	0.271	105,599,383	0.261	0.072
2	0.94	3,867	0.137	60,757,828	0.150	0.064
3	0.86	8,904	0.316	136,184,560	0.336	0.065
4	0.71	7,689	0.273	102,074,145	0.252	0.075
5	0.00	19	0.001	124,585	0.000	0.153
6	0.00	39	0.001	271,214	0.001	0.144
All subareas combined <sup>b</sup>	0.61	28,163	1.000	405,011,715	1.000	0.070
95% Confidence interval		±6,073		±99,896,680		

<sup>a</sup> Variances of abundance estimates are given in Appendix D.

<sup>b</sup> Differences in sums of estimates and totals are due to rounding.

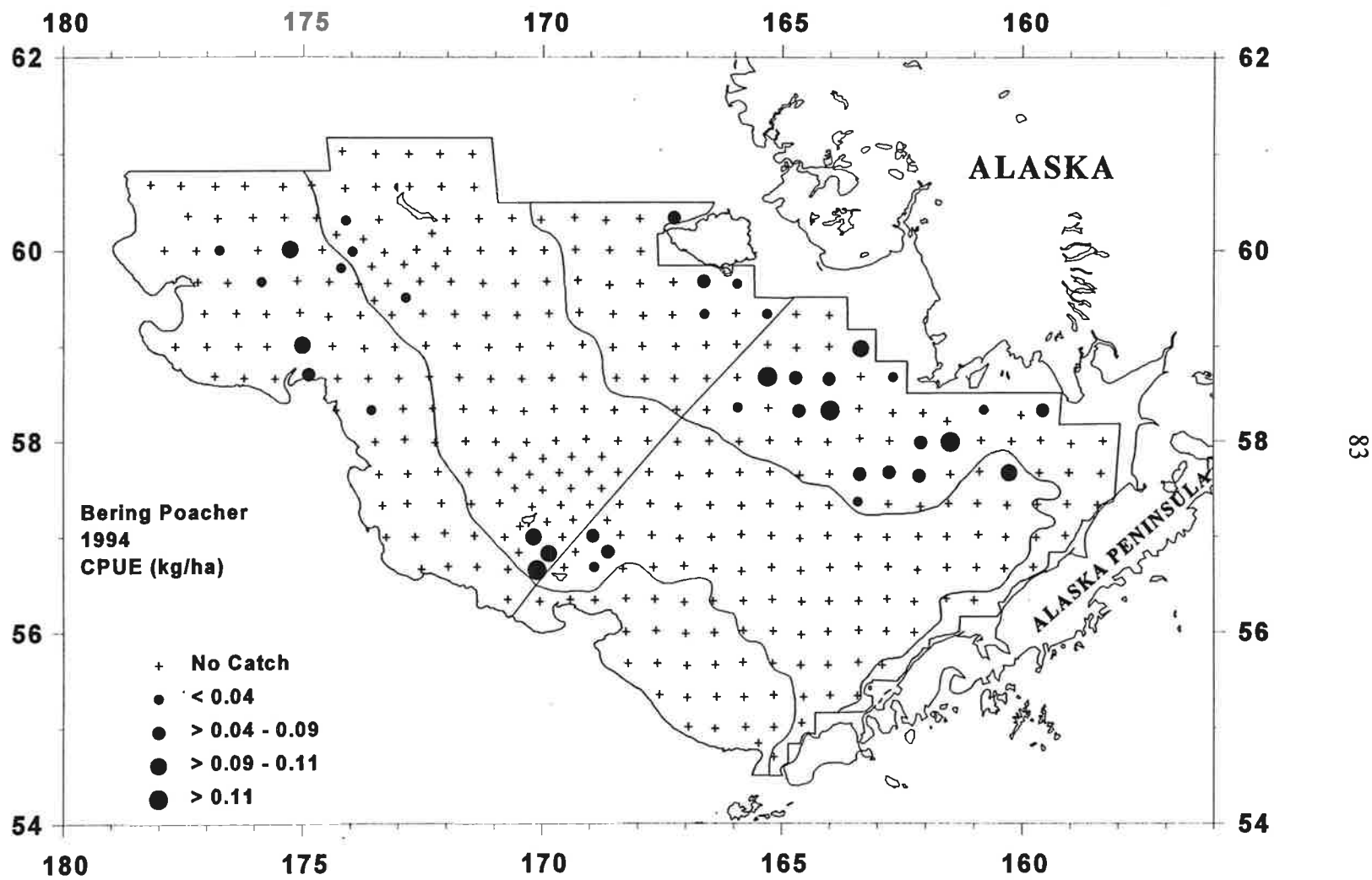


Figure 41.--Distribution and relative abundance in kg/ha of Bering poacher, 1994 eastern Bering Sea bottom trawl survey.



Table 32.--Abundance estimates and mean size of Bering poacher by subarea, 1994 eastern Bering Sea bottom trawl survey.

Subarea	Mean CPUE (kg/ha)	Estimated biomass (t) <sup>a</sup>	Proportion of estimated biomass	Estimated population numbers <sup>a</sup>	Proportion of estimated population	Mean Weight (kg)
1	0.02	182	0.537	2,790,263	0.529	0.065
2	0.01	34	0.100	513,302	0.097	0.066
3	0.00	33	0.097	510,738	0.097	0.065
4	0.00	31	0.091	649,028	0.123	0.048
5	0.00	0	0.000	0	0.000	0.000
6	0.01	59	0.174	816,207	0.155	0.072
All subareas combined <sup>b</sup>	0.01	339	1.000	5,279,537	1.000	0.064
95% Confidence interval		±117		±1,832,141		

<sup>a</sup> Variances of abundance estimates are given in Appendix D.

<sup>b</sup> Differences in sums of estimates and totals are due to rounding.

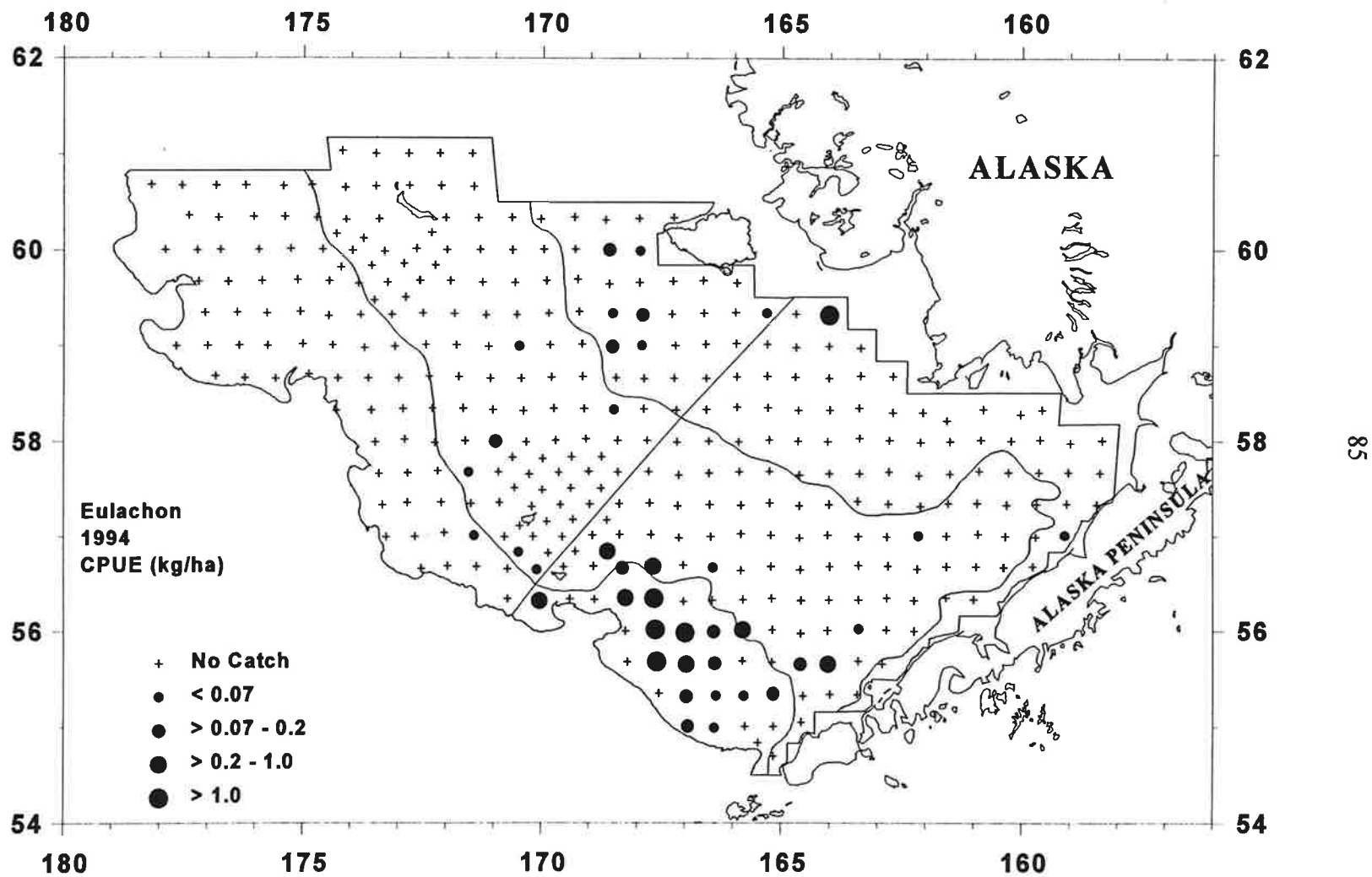


Figure 42.--Distribution and relative abundance in kg/ha of eulachon, 1994 eastern Bering Sea bottom trawl survey.

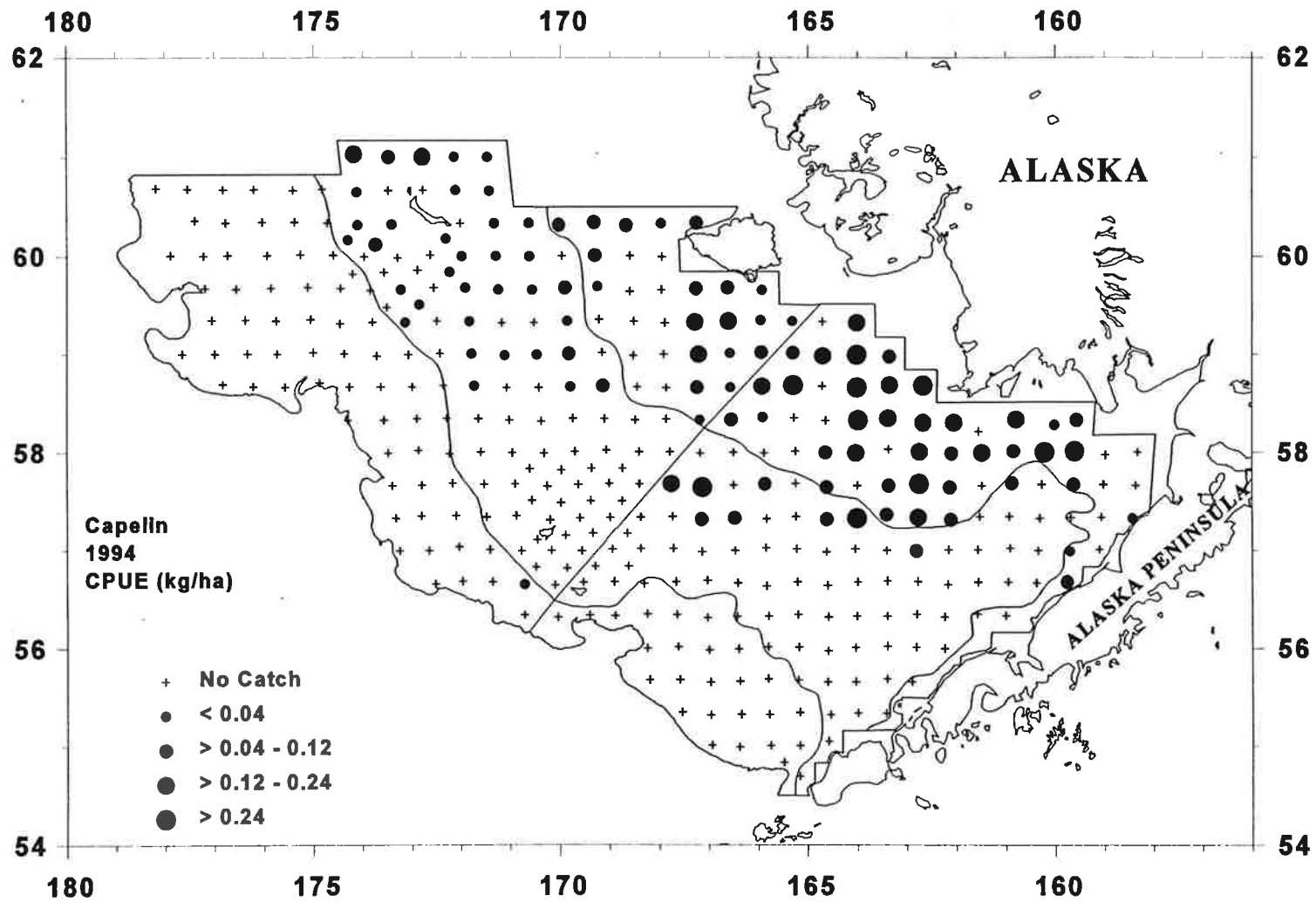


Figure 43.--Distribution and relative abundance in kg/ha of capelin, 1994 eastern Bering Sea bottom trawl survey.

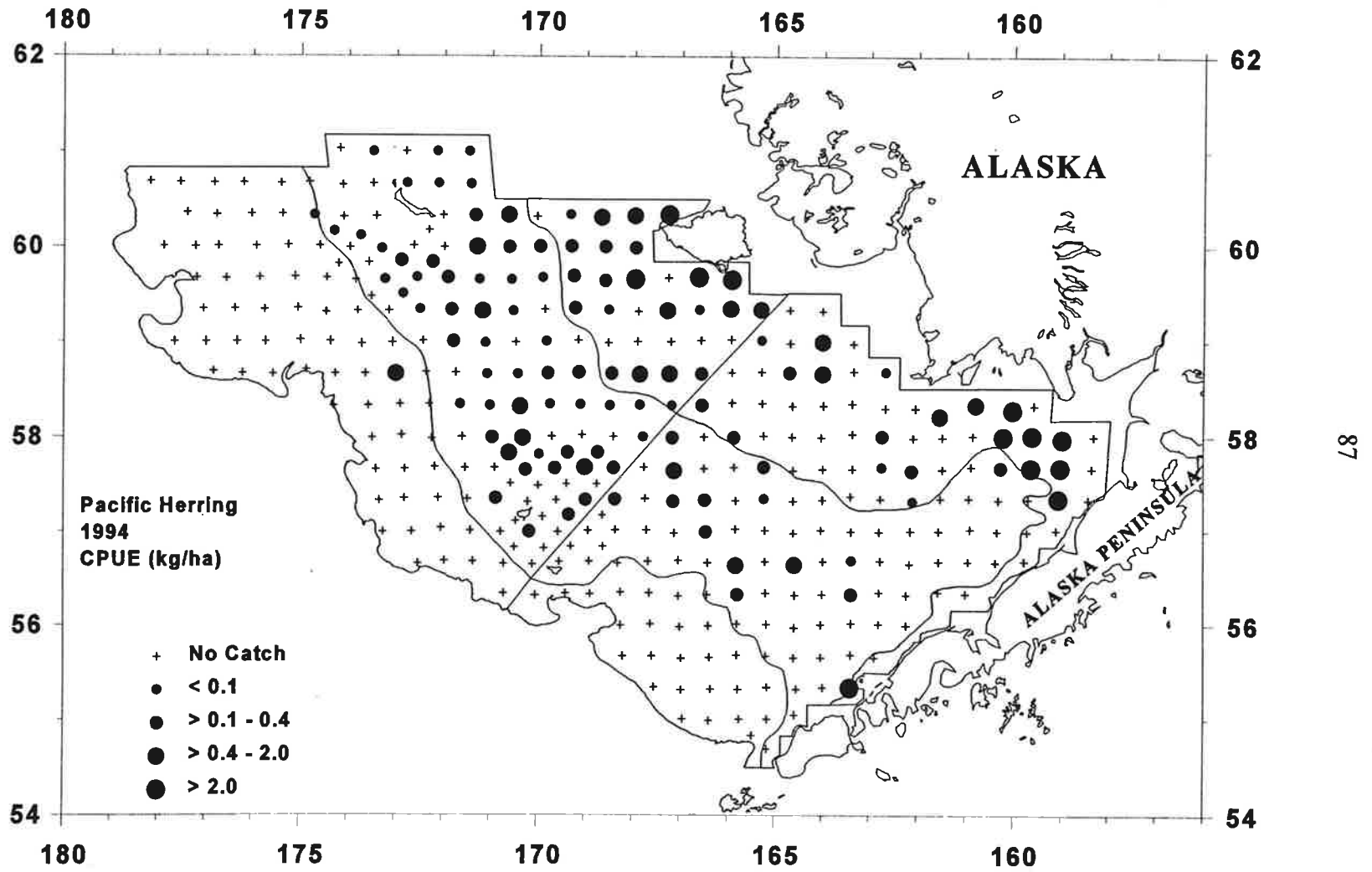


Figure 44.--Distribution and relative abundance in kg/ha of Pacific herring, 1994 eastern Bering Sea bottom trawl survey.

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## APPENDIX A

## Station Data, 1994 Eastern Bering Sea Bottom Trawl Survey

Appendix A contains station data by vessel for the 355 successfully completed standard survey stations. In using the tables, the following should be noted:

1. Time represents the nearest hour at the start of the tow.
2. Haul numbers are not always sequential because special study and unsatisfactory hauls were omitted.
3. Negative longitude indicates western hemisphere.
4. Width codes are as follows:

M = Net width was measured by mensuration gear.

F = Net width was estimated from a function of wire out or wire out and net height.

5. Hauls marked with an "\*" were used for the FPC analysis. Nineteen additional special study hauls not listed here were also used for that analysis. For reference purposes, these hauls were: F/V Arcturus-175-184, 186- F/V Aldebaran - 177-179, 181-185.

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Table A-1.--Haul data for stations sampled by the F/V Arcturus during the 1994 eastern Bering Sea bottom trawl survey.

Haul	MM/DD/YY	Latitude	Longitude	Depth (m)	Time (hr.)	Duration (hr.)	Distance (km)	Strata	Surf. Temp.	Gear. Temp.	Net Width (m)	Width Code	
*	1	06/03/94	56.674	-159.759	33	16	0.49	2.78	10	4.6	3.9	14.1	M
*	2	06/04/94	56.986	-159.702	53	06	0.48	2.93	10	3.0	3.0	15.8	M
*	3	06/04/94	57.332	-159.676	55	09	0.48	2.98	10	3.2	3.1	16.4	M
*	4	06/04/94	57.664	-159.633	48	11	0.49	2.85	10	3.3	3.2	15.9	M
*	5	06/04/94	58.005	-159.610	38	14	0.50	2.93	10	3.1	3.0	16.0	M
*	6	06/04/94	58.322	-159.570	22	16	0.51	2.87	10	5.8	3.9	14.1	M
*	7	06/05/94	58.327	-160.796	18	06	0.49	2.83	10	6.5	6.2	15.1	F
*	8	06/05/94	58.004	-160.848	44	09	0.36	2.13	10	4.4	3.0	16.5	M
*	9	06/05/94	57.678	-160.879	53	12	0.51	3.17	31	3.2	3.0	16.2	M
*	10	06/05/94	57.341	-160.923	60	14	0.48	2.89	31	3.2	2.9	16.4	M
*	11	06/05/94	57.016	-160.903	68	17	0.51	2.83	31	3.5	2.6	16.6	M
*	12	06/06/94	56.671	-160.943	71	06	0.51	3.04	31	3.5	2.6	16.1	M
*	13	06/06/94	55.996	-162.237	66	12	0.50	2.96	31	4.7	3.6	17.9	M
*	14	06/06/94	56.316	-162.238	77	15	0.49	2.78	31	5.4	2.8	16.4	M
*	15	06/06/94	56.645	-162.167	73	17	0.48	2.96	31	5.4	2.4	16.7	M
*	16	06/07/94	56.997	-162.151	60	06	0.49	2.87	31	5.0	2.4	16.0	M
*	17	06/07/94	57.308	-162.106	49	09	0.51	3.06	10	3.7	2.1	17.7	M
*	18	06/07/94	57.634	-162.136	44	12	0.50	2.74	10	3.4	2.4	16.6	M
*	19	06/07/94	57.980	-162.100	35	15	0.49	2.89	10	3.6	3.2	15.5	M
*	20	06/07/94	58.293	-162.055	42	17	0.49	2.80	10	4.3	0.0	16.2	M
*	21	06/08/94	58.973	-163.356	20	06	0.49	2.74	10	4.0	4.3	14.2	M
*	22	06/08/94	58.680	-163.353	29	08	0.51	2.78	10	3.9	3.5	14.6	M
*	23	06/08/94	58.341	-163.385	35	11	0.50	2.91	10	4.6	3.1	14.9	M
*	24	06/08/94	58.024	-163.374	40	13	0.49	2.80	10	3.4	2.8	15.6	M
*	25	06/08/94	57.655	-163.371	44	16	0.51	2.89	10	3.1	2.1	15.8	M
*	26	06/09/94	57.361	-163.409	51	06	0.49	2.65	10	4.1	1.7	15.4	M
*	27	06/09/94	56.991	-163.401	64	09	0.50	2.78	31	6.0	1.7	16.4	M
*	28	06/09/94	56.684	-163.396	73	11	0.51	2.67	31	6.3	1.9	16.9	M
*	30	06/09/94	56.324	-163.399	82	15	0.50	2.76	31	7.1	2.3	16.8	M
*	31	06/09/94	56.019	-163.394	88	17	0.49	2.95	31	7.6	2.8	15.6	M
*	32	06/10/94	55.684	-163.400	82	06	0.36	1.93	31	7.1	3.3	16.1	M
*	33	06/10/94	55.336	-163.416	51	09	0.38	2.24	31	7.1	4.5	15.9	F
*	34	06/10/94	55.322	-164.541	101	13	0.42	2.45	31	7.0	4.5	17.0	M



Table A-1.--Continued.

Haul	MM/DD/YY	Latitude	Longitude	Depth (m)	Time Duration (hr.)	Duration (hr.)	Distance (km)	Strata	Surf. Temp.	Gear. Temp.	Net Width (m)	Width Code	
*	35	06/10/94	55.051	-164.580	62	15	0.50	2.96	31	7.0	4.6	15.8	M
*	36	06/11/94	55.654	-164.601	95	10	0.50	2.59	31	6.9	3.7	17.1	M
*	37	06/11/94	55.973	-164.594	91	12	0.49	2.69	31	7.2	3.6	16.7	M
*	38	06/11/94	56.318	-164.588	84	15	0.50	2.76	31	7.3	2.5	15.9	M
*	39	06/12/94	56.639	-164.598	73	06	0.50	2.82	31	6.4	2.2	16.6	M
*	40	06/12/94	56.977	-164.617	68	09	0.49	2.80	31	6.4	1.7	15.8	M
*	41	06/12/94	57.314	-164.623	64	11	0.49	2.67	31	6.3	1.0	16.3	M
*	42	06/12/94	57.641	-164.621	53	13	0.49	2.78	10	4.9	1.1	15.3	M
*	43	06/12/94	57.994	-164.651	44	16	0.50	2.74	10	4.6	2.0	16.2	M
*	44	06/13/94	58.318	-164.643	42	06	0.48	2.82	10	3.6	2.5	16.1	M
*	45	06/13/94	58.666	-164.712	35	09	0.51	2.80	10	3.9	3.1	15.3	M
*	46	06/13/94	58.982	-164.697	26	13	0.48	2.80	10	4.2	3.9	15.2	M
*	47	06/13/94	59.331	-164.708	18	17	0.51	2.96	10	8.6	6.5	15.2	M
*	48	06/14/94	59.650	-165.939	20	06	0.50	2.91	20	5.6	5.5	15.3	M
*	49	06/14/94	59.343	-165.965	22	08	0.50	2.65	20	4.7	4.6	15.0	M
*	50	06/14/94	59.020	-165.946	27	11	0.49	2.80	20	3.7	3.3	15.2	M
*	51	06/14/94	58.671	-165.931	35	13	0.50	2.65	10	3.0	2.5	15.5	M
*	52	06/14/94	58.353	-165.924	42	15	0.52	2.74	10	2.7	1.9	15.4	M
*	53	06/15/94	57.992	-165.885	55	06	0.49	2.85	10	2.3	0.6	16.5	M
*	54	06/15/94	57.675	-165.871	62	09	0.49	2.72	31	4.0	0.0	16.6	M
*	55	06/15/94	57.320	-165.835	68	12	0.50	2.74	31	4.5	0.0	16.6	M
*	56	06/15/94	57.022	-165.838	70	14	0.49	2.85	31	5.1	1.1	17.2	M
*	58	06/15/94	56.636	-165.834	77	18	0.49	2.76	31	5.7	2.2	17.3	M
*	59	06/16/94	56.328	-165.798	90	06	0.33	1.96	31	6.1	3.5	17.1	M
*	60	06/16/94	56.014	-165.802	104	08	0.51	2.87	31	6.4	3.8	17.3	M
*	61	06/16/94	55.686	-165.808	117	11	0.25	1.26	50	6.3	3.9	18.1	M
*	62	06/16/94	55.323	-165.785	119	14	0.51	2.89	50	6.4	3.9	17.8	M
*	63	06/16/94	55.008	-165.752	128	17	0.41	2.41	50	6.1	3.9	17.9	M
*	64	06/17/94	55.010	-166.940	154	06	0.51	2.93	50	6.3	3.8	18.0	M
*	65	06/17/94	55.318	-166.968	137	09	0.52	3.06	50	6.5	3.9	18.0	M
*	66	06/17/94	55.652	-166.972	134	11	0.49	3.09	50	6.7	3.9	18.1	M
*	67	06/17/94	55.985	-166.999	135	13	0.53	2.98	50	6.4	3.9	17.2	F
*	68	06/17/94	56.312	-167.029	113	16	0.50	2.91	50	6.6	3.8	17.1	M

Table A-1.--Continued.

Haul	MM/DD/YY	Latitude	Longitude	Depth (m)	Time (hr.)	Duration (hr.)	Distance (km)	Strata	Surf. Temp.	Gear. Temp.	Net (m)	Width Code	
*	69	06/18/94	56.691	-167.031	93	06	0.50	2.96	31	6.3	3.3	17.2	M
*	70	06/18/94	56.979	-167.126	73	09	0.49	2.83	31	5.3	2.4	16.4	M
*	71	06/18/94	57.315	-167.152	68	11	0.49	2.96	31	5.5	1.2	14.8	M
*	72	06/18/94	57.640	-167.135	66	13	0.49	2.89	31	5.2	0.5	16.2	M
*	73	06/19/94	57.673	-168.405	68	06	0.50	3.04	42	5.4	1.4	16.2	M
*	74	06/19/94	57.338	-168.374	71	09	0.51	2.78	32	5.0	1.4	16.7	M
*	75	06/19/94	57.014	-168.358	79	11	0.48	2.57	32	5.7	2.8	16.1	M
*	76	06/19/94	56.661	-168.305	104	14	0.52	2.78	50	6.8	3.9	16.6	M
*	77	06/19/94	56.349	-168.243	146	16	0.40	2.32	50	6.8	0.0	17.4	M
*	78	06/20/94	56.001	-168.243	148	06	0.50	2.78	50	6.6	3.8	17.4	M
*	79	06/20/94	55.675	-168.200	134	09	0.49	2.78	50	6.7	3.8	18.1	M
*	80	06/24/94	57.990	-167.172	62	06	0.49	2.78	31	5.1	-0.3	16.8	M
	81	06/24/94	57.997	-166.507	60	09	0.50	2.93	31	4.3	0.3	16.4	M
	82	06/24/94	58.329	-166.560	46	12	0.50	2.80	10	3.2		15.3	M
*	83	06/24/94	58.329	-167.190	49	14	0.50	2.96	20	3.2		16.3	M
*	84	06/24/94	58.660	-167.242	42	17	0.51	2.91	20	3.2		15.9	M
	85	06/25/94	58.660	-166.570	38	06	0.49	2.82	20	3.3		16.3	M
	86	06/25/94	59.011	-166.582	31	09	0.49	3.15	20	4.2		15.4	M
*	87	06/25/94	58.999	-167.214	38	11	0.49	2.74	20	3.3		15.0	M
*	88	06/25/94	59.327	-167.292	29	15	0.50	2.70	20	4.8		14.9	M
	89	06/25/94	59.335	-166.620	26	18	0.50	2.93	20	5.8		14.5	M
	90	06/26/94	59.675	-166.638	24	06	0.49	2.95	20	5.7		14.9	M
*	91	06/26/94	59.668	-167.272	29	08	0.49	2.72	20	4.4		15.0	M
	92	06/26/94	60.338	-167.263	27	13	0.49	3.15	20	5.0		15.6	M
*	93	06/26/94	60.329	-167.979	29	16	0.50	3.04	20	4.1		16.7	M
*	94	06/27/94	60.318	-170.040	51	06	0.50	2.85	20	5.0		16.3	M
*	95	06/27/94	60.001	-169.972	53	08	0.51	2.83	41	4.4		15.7	M
*	96	06/27/94	59.675	-169.914	55	11	0.50	2.85	41	5.2		16.8	M
*	97	06/27/94	59.341	-169.863	59	13	0.49	2.83	41	4.9		16.9	M
*	98	06/27/94	59.005	-169.829	62	16	0.49	2.83	41	5.3		16.4	F
*	99	06/28/94	58.666	-169.796	66	06	0.49	2.87	41	5.9		16.8	M
*	100	06/28/94	58.342	-169.745	68	08	0.50	2.83	41	5.8		16.3	M
*	101	06/28/94	58.006	-169.699	70	11	0.49	2.87	42	5.6		15.6	M

Table A-1.--Continued.

Haul	MM/DD/YY	Latitude	Longitude	Depth (m)	Time Duration (hr.)	Duration (hr.)	Distance (km)	Strata	Surf. Temp.	Gear. Temp.	Net Width (m)	Width Code
* 102	06/28/94	57.836	-169.369	66	13	0.49	2.78	42	5.6		16.3	M
* 103	06/28/94	57.668	-169.635	70	15	0.50	2.82	42	6.4		16.3	M
* 104	06/28/94	57.504	-169.384	70	17	0.49	2.85	42	5.9		15.7	M
* 105	06/29/94	57.329	-169.598	60	06	0.50	2.89	42	3.2		16.4	M
* 106	06/29/94	57.175	-169.338	70	08	0.50	2.89	42	6.4		15.3	M
* 107	06/29/94	56.993	-169.561	59	10	0.51	2.93	42	4.6		16.1	M
* 108	06/29/94	56.838	-169.290	79	12	0.50	2.74	32	6.1		17.0	M
* 109	06/29/94	56.674	-169.530	79	14	0.52	2.89	32	5.0		16.4	M
* 110	06/29/94	56.339	-169.400	141	17	0.49	2.95	50	7.0		17.6	M
* 111	06/30/94	56.340	-170.709	121	07	0.50	2.61	61	6.1		17.1	M
* 112	06/30/94	56.654	-170.707	113	09	0.48	2.76	61	6.6		17.6	M
* 113	06/30/94	56.829	-170.479	101	11	0.49	2.70	42	6.0		17.6	M
* 114	06/30/94	56.994	-170.770	95	13	0.49	2.85	42	6.4		17.2	M
* 115	06/30/94	57.108	-170.455	49	15	0.49	2.89	42	4.5		15.0	M
* 118	07/01/94	57.350	-170.879	82	12	0.50	2.98	42	6.6		16.3	M
* 119	07/01/94	57.508	-170.564	73	15	0.50	2.89	42	6.1		15.8	M
* 121	07/01/94	57.675	-170.904	84	18	0.50	2.89	42	6.4		16.2	M
* 122	07/02/94	57.831	-170.610	77	06	0.50	2.80	42	5.4		16.1	M
* 123	07/02/94	57.994	-170.962	86	08	0.49	2.78	42	5.4		16.4	M
* 124	07/02/94	58.326	-171.021	84	11	0.50	2.91	41	5.3		16.4	M
* 125	07/02/94	58.657	-171.077	82	13	0.51	2.85	41	5.6		16.5	M
* 126	07/02/94	58.989	-171.120	79	15	0.50	2.83	41			16.8	M
* 127	07/03/94	59.323	-171.179	75	06	0.50	2.85	41	5.9		16.6	M
* 128	07/03/94	59.657	-171.252	71	09	0.50	2.72	41	5.9		16.6	M
* 129	07/03/94	59.999	-171.302	68	11	0.50	2.85	41	5.6		16.3	M
* 130	07/03/94	59.997	-171.996	66	14	0.50	2.78	43	5.9		16.2	M
* 131	07/03/94	59.836	-172.243	75	16	0.50	2.78	43	6.1		16.2	M
* 132	07/04/94	59.676	-171.920	77	06	0.50	2.83	43	6.9		16.2	M
* 133	07/04/94	59.338	-171.836	79	09	0.50	2.80	43	6.2		16.3	M
* 134	07/04/94	59.005	-171.790	86	11	0.50	2.83	41	6.6		15.8	M
* 135	07/04/94	58.675	-171.737	93	13	0.50	2.80	41	6.6		16.4	M
* 136	07/04/94	58.342	-171.647	95	16	0.50	2.85	41	6.2		15.9	M

Table A-1.--Continued.

Haul	MM/DD/YY	Latitude	Longitude	Depth (m)	Time (hr.)	Duration (hr.)	Distance (km)	Strata	Surf. Temp.	Gear. Temp.	Net (m)	Width Code
* 137	07/06/94	58.001	-171.595	99	06	0.50	2.83	41	5.9		16.7	M
* 138	07/06/94	57.674	-171.531	99	09	0.50	2.83	41	6.9		16.5	M
* 139	07/06/94	57.339	-171.475	99	12	0.50	2.72	41	6.9		16.5	M
* 141	07/06/94	57.006	-171.407	108	16	0.50	2.67	61	7.3		16.5	M
* 142	07/06/94	56.678	-171.354	119	18	0.51	2.80	61	7.2		16.5	M
* 143	07/07/94	56.657	-172.516	144	06	0.50	2.80	61	7.0		16.5	M
* 144	07/07/94	56.997	-172.647	123	09	0.50	2.80	61	6.9		17.1	F
* 146	07/07/94	57.349	-172.805	115	13	0.50	2.78	61	7.4		17.1	F
* 147	07/07/94	57.662	-172.799	119	15	0.50	2.69	61	7.3		17.7	M
* 148	07/07/94	58.019	-172.868	110	18	0.50	2.87	61	6.8		17.1	F
* 149	07/08/94	58.343	-172.904	110	06	0.50	2.65	61	6.3		17.3	M
* 150	07/08/94	58.663	-173.000	112	09	0.50	2.82	61	6.2		17.6	M
* 151	07/08/94	58.994	-173.082	106	11	0.50	2.74	61	6.2		18.1	M
* 152	07/08/94	59.328	-173.151	99	14	0.50	2.78	43	6.0		17.4	M
* 153	07/08/94	59.658	-173.237	95	16	0.50	2.80	43	6.1		17.9	M
* 154	07/08/94	59.832	-173.577	95	18	0.50	2.70	43	6.2		17.9	M
* 155	07/09/94	59.979	-173.304	75	06	0.50	2.78	43	5.4		16.8	M
* 157	07/09/94	60.319	-173.422	62	11	0.50	2.76	43	5.7		17.4	M
* 158	07/09/94	60.662	-173.486	64	14	0.50	2.76	41	5.5		16.6	M
159	07/09/94	60.668	-172.789	42	17	0.50	2.76	41	4.8		15.7	M
* 160	07/10/94	60.680	-174.825	99	06	0.50	2.70	41	5.5		16.9	F
* 161	07/10/94	60.337	-174.720	104	09	0.50	2.80	62	5.6		16.9	F
* 162	07/10/94	60.006	-174.599	108	11	0.50	2.93	62	6.2		17.1	F
* 163	07/10/94	59.671	-174.457	113	14	0.50	2.76	62	6.7		17.1	M
* 165	07/10/94	59.312	-174.464	121	18	0.50	2.91	62	6.5		17.3	M
* 166	07/11/94	59.005	-174.377	126	06	0.51	2.87	61	6.4		17.2	F
* 167	07/11/94	58.663	-174.271	154	09	0.50	2.82	61	6.9		17.5	M
* 168	07/11/94	58.326	-174.299	165	11	0.50	2.78	61	7.2		17.0	M
169	07/18/94	60.667	-172.121	60	07	0.50	2.74	41	7.2	-1.4	16.4	F
170	07/18/94	60.659	-171.437	62	09	0.50	2.78	41	7.7	-1.4	16.4	F
171	07/18/94	61.000	-171.479	59	11	0.50	2.89	41	8.0	-1.4	18.0	M
172	07/18/94	61.001	-172.152	62	14	0.56	3.06	41	6.6	-1.2	17.6	M
173	07/18/94	60.999	-172.803	66	16	0.50	2.74	41	7.7	-1.4	16.9	M

Table A-1.--Continued.

Haul	MM/DD/YY	Latitude	Longitude	Depth (m)	Time (hr.)	Duration (hr.)	Distance (km)	Strata	Surf. Temp.	Gear. Temp.	Net Width (m)	Width Code
* 174	07/19/94	60.999	-173.491	75	06	0.50	2.80	41	7.5	-1.4	17.2	M
* 187	07/22/94	60.669	-176.823	130	09	0.50	2.80	61	6.9	1.5	17.2	F
* 188	07/22/94	60.673	-176.206	119	12	0.49	2.65	61	7.4	1.2	17.4	M
* 189	07/22/94	60.343	-176.042	121	14	0.50	2.78	61	7.2	1.7	17.1	F
* 190	07/22/94	60.005	-175.935	130	17	0.50	2.76	61	7.4	1.9	17.2	F
* 191	07/23/94	60.004	-176.737	143	07	0.50	2.95	61	7.4	1.9	17.1	M
* 192	07/23/94	59.674	-175.864	137	11	0.50	2.80	61	7.3	2.2	17.2	F
* 193	07/23/94	59.339	-175.757	135	13	0.49	2.80	61	8.1	2.0	17.2	F
* 194	07/23/94	59.346	-176.379	135	16	0.50	2.85	61	8.0	2.2	16.7	M
* 195	07/23/94	59.003	-176.335	135	18	0.50	2.74	61	8.4	2.5	17.2	F
* 196	07/24/94	59.001	-175.740	134	07	0.50	2.78	61	8.1	2.2	17.2	F
* 197	07/24/94	58.667	-176.218	139	10	0.50	2.80	61	8.3	3.2	17.2	M
* 198	07/24/94	58.661	-175.576	135	13	0.51	2.82	61	8.3	2.8	18.3	M

Table A-2.--Haul data for stations sampled by the F/V Aldebaran during the 1994 eastern Bering Sea bottom trawl survey.

Haul	MM/DD/YY	Latitude	Longitude	Depth (m)	Time (hr.)	Duration (hr.)	Distance (km)	Strata	Surf. Temp.	Gear. Temp.	Net Width (m)	Width Code
1	06/03/94	57.997	-158.312	35	09	0.50	2.80	10	3.5	3.4	15.6	F
2	06/03/94	57.658	-158.350	33	12	0.49	2.72	10	3.7	3.6	15.6	F
3	06/03/94	57.326	-158.420	26	14	0.50	2.67	10	4.6	4.2	15.6	F
* 4	06/04/94	57.005	-159.091	27	06	0.49	2.74	10	3.8	3.6	16.9	M
* 5	06/04/94	57.335	-159.052	48	09	0.49	2.74	10	3.8	3.6	16.3	F
* 6	06/04/94	57.665	-159.016	46	12	0.51	2.69	10	2.8	2.7	16.5	M
* 7	06/04/94	57.968	-158.981	35	14	0.49	2.63	10	4.1	2.8	15.5	M
* 8	06/05/94	58.271	-160.020	29	06	0.36	2.11	10	4.6	2.7	15.6	F
* 9	06/05/94	57.995	-160.216	48	08	0.51	2.85	10	4.2		16.2	M
* 10	06/05/94	57.665	-160.269	53	11	0.49	2.82	31	2.5	2.5	16.2	M
* 11	06/05/94	57.323	-160.305	59	14	0.49	2.87	31	2.8	2.5	16.7	M
* 12	06/05/94	56.992	-160.336	59	16	0.50	2.78	31	2.8	2.3	16.2	M
* 13	06/06/94	56.663	-160.372	57	06	0.50	2.67	31	4.1	2.9	16.4	M
14	06/06/94	56.329	-160.993	51	09	0.48	2.69	10	4.2	3.2	15.2	M
* 15	06/06/94	56.347	-161.569	66	12	0.49	2.56	10	4.3	3.1	16.2	M
* 16	06/06/94	56.672	-161.560	88	14	0.50	2.72	31	5.0	1.9	15.7	M
* 17	06/06/94	56.997	-161.560	66	17	0.50	2.70	31	1.8	1.7	16.5	M
* 18	06/07/94	57.339	-161.521	55	06	0.50	2.63	31	2.9	1.8	17.0	M
* 19	06/07/94	57.649	-161.484	51	09	0.50	2.65	10	2.4	2.5	16.8	M
* 20	06/07/94	57.988	-161.488	51	12	0.50	2.83	10	2.8	2.6	16.1	M
* 22	06/07/94	58.207	-161.551	35	16	0.18	1.02	10	3.6	3.2	15.6	F
* 23	06/08/94	58.673	-162.678	22	06	0.51	2.78	10	3.4	3.4	15.1	M
* 24	06/08/94	58.293	-162.681	31	09	0.49	2.80	10	3.8	3.6	15.7	M
* 25	06/08/94	57.999	-162.753	38	11	0.50	2.76	10	2.9	2.7	16.7	M
* 26	06/08/94	57.673	-162.759	40	14	0.49	2.76	10	2.0	1.8	16.8	M
* 27	06/08/94	57.334	-162.773	46	16	0.50	2.87	10	1.9	1.7	17.0	M
* 28	06/09/94	56.987	-162.806	60	06	0.50	2.83	31	5.3	1.6	16.8	M
* 29	06/09/94	56.679	-162.780	70	08	0.49	2.65	31	5.9	1.7	16.7	M
* 30	06/09/94	56.344	-162.804	77	11	0.49	2.89	31	5.8	2.5	17.5	M
* 31	06/09/94	56.010	-162.817	75	13	0.49	2.78	31	5.9	2.4	17.2	M
* 33	06/09/94	55.653	-162.902	48	17	0.12	0.69	10	5.1	3.6	15.8	M
* 34	06/10/94	55.339	-163.987	73	06	0.18	1.02	31	6.0	3.4	16.9	M
* 35	06/10/94	55.345	-165.169	110	10	0.22	1.20	50	5.7	3.6	17.7	M

Table A-2.--Continued.

Haul	MM/DD/YY	Latitude	Longitude	Depth (m)	Time (hr.)	Duration (hr.)	Distance (km)	Strata	Surf. Temp.	Gear. Temp.	Net Width (m)	Width Code	
*	36	06/10/94	55.006	-165.161	110	13	0.49	2.70	50	5.2	3.3	17.4	M
	37	06/10/94	54.695	-165.159	84	15	0.47	2.61	31	4.9	4.2	16.3	M
*	38	06/11/94	55.655	-164.028	93	11	0.50	2.69	31	7.5		17.1	M
*	39	06/11/94	56.004	-164.037	88	15	0.50	2.63	31	6.2	2.4	16.7	M
*	40	06/11/94	56.325	-164.010	84	17	0.49	2.61	31	6.8	1.8	16.9	M
*	41	06/12/94	56.674	-163.993	73	06	0.49	2.76	31	6.4	1.3	17.0	M
*	42	06/12/94	57.008	-164.035	66	08	0.49	2.80	31	6.0	1.1	16.3	M
*	43	06/12/94	57.325	-164.006	60	11	0.50	2.80	31	5.5	0.7	16.7	M
*	44	06/12/94	57.654	-163.999	49	13	0.49	2.69	10	3.7	1.2	15.8	M
*	45	06/12/94	57.988	-164.036	44	16	0.49	2.65	10	4.3	1.8	16.2	M
*	46	06/13/94	58.322	-163.991	38	06	0.50	2.72	10	4.5	2.3	16.7	M
*	47	06/13/94	58.656	-164.014	31	10	0.49	2.83	10	3.4	3.1	15.7	M
*	48	06/13/94	58.992	-164.013	26	13	0.50	2.82	10	4.6	4.3	16.1	M
*	49	06/13/94	59.320	-164.014	18	17	0.51	2.74	10	7.8	6.3	16.1	M
*	50	06/14/94	59.337	-165.323	16	06	0.51	3.26	20	5.5		15.6	F
*	51	06/14/94	59.014	-165.303	24	08	0.51	2.89	10	3.3	3.3	16.0	M
*	52	06/14/94	58.678	-165.301	37	11	0.50	2.85	10	2.5	2.3	15.4	M
*	53	06/14/94	58.345	-165.284	42	13	0.50	2.72	10	2.2	1.7	17.0	M
*	54	06/14/94	58.009	-165.254	48	16	0.49	2.76	10	1.8	1.2	17.1	M
*	55	06/15/94	57.679	-165.247	59	06	0.49	2.72	31	3.7	-0.1	17.4	M
*	56	06/15/94	57.343	-165.240	66	08	0.49	2.85	31	4.2	0.0	17.2	M
*	57	06/15/94	57.008	-165.218	70	11	0.25	1.35	31	4.2	1.3	19.2	M
*	58	06/15/94	56.675	-165.211	75	13	0.50	2.91	31	5.1	1.5	17.8	M
*	59	06/15/94	56.341	-165.200	84	15	0.49	2.76	31	5.6	2.3	16.9	M
*	60	06/16/94	56.011	-165.183	93	06	0.38	1.96	31	5.6	3.2	17.6	F
*	61	06/16/94	55.674	-165.194	106	09	0.49	2.69	31	5.6	3.3	18.2	M
	62	06/16/94	54.836	-165.483	154	14	0.49	2.80	50	5.2	3.3	18.1	M
*	63	06/17/94	54.992	-166.387	144	06	0.50	2.82	50	5.4	3.2	18.2	M
*	64	06/17/94	55.326	-166.353	132	09	0.50	2.85	50	5.7	3.3	18.4	M
*	65	06/17/94	55.662	-166.381	124	11	0.33	1.93	50	6.0	3.3	18.2	M
*	66	06/17/94	55.993	-166.401	123	13	0.49	2.76	50	6.2	3.3	17.4	M
*	67	06/17/94	56.324	-166.428	102	16	0.49	2.78	31	5.9	3.3	16.9	M
*	68	06/18/94	56.665	-166.416	84	06	0.49	2.69	31	5.7	2.3	16.5	M

Table A-2.--Continued.

Haul	MM/DD/YY	Latitude	Longitude	Depth (m)	Time (hr.)	Duration (hr.)	Distance (km)	Strata	Surf. Temp.	Gear. Temp.	Net Width (m)	Width Code	
*	69	06/18/94	56.991	-166.461	71	09	0.49	2.76	31	4.9	1.4	16.1	M
*	70	06/18/94	57.327	-166.485	59	11	0.49	2.69	31	4.6	0.0	16.6	M
*	71	06/18/94	57.662	-166.501	66	14	0.49	2.67	31	3.8	-0.4	16.9	M
*	72	06/19/94	57.678	-167.760	68	06	0.50	2.69	31	5.5		17.2	M
*	73	06/19/94	57.344	-167.734	71	09	0.50	2.74	31	4.9	1.4	16.8	M
*	74	06/19/94	57.014	-167.704	75	11	0.50	2.72	31	4.7	1.8	16.5	M
*	75	06/19/94	56.678	-167.666	102	14	0.50	2.74	31	5.7	3.2	16.4	M
*	76	06/19/94	56.343	-167.644	128	16	0.48	2.65	50	6.1	3.5	17.6	M
*	77	06/20/94	56.016	-167.616	132	06	0.49	2.70	50	6.2	3.6	17.6	M
*	78	06/20/94	55.677	-167.589	134	08	0.50	2.74	50	6.3	3.5	18.0	M
*	79	06/20/94	55.348	-167.546	146	11	0.51	2.65	50	6.0	3.3	18.0	M
*	80	06/24/94	58.002	-167.790	66	06	0.52	2.67	41	5.1	0.3	16.9	M
*	81	06/24/94	58.002	-168.411	68	09	0.50	2.69	42	5.6	-0.5	16.6	M
	82	06/24/94	58.329	-168.490	64	12	0.50	2.61	41	5.4	-0.3	16.6	M
*	83	06/24/94	58.334	-167.863	59	14	0.50	2.67	41	5.1	-0.7	16.0	M
*	84	06/24/94	58.656	-167.864	44	17	0.50	3.06	20	3.3	2.0	16.1	M
	85	06/25/94	58.665	-168.453	51	06	0.50	2.76	20	4.0	0.2	16.3	M
	86	06/25/94	58.988	-168.531	44	08	0.50	2.74	20	2.9	2.0	16.1	M
*	87	06/25/94	59.001	-167.913	40	11	0.50	2.83	20	3.3	2.3	16.2	M
*	88	06/25/94	59.319	-167.900	37	16	0.50	2.76	20	3.4	2.5	15.0	M
	89	06/25/94	59.335	-168.523	38	18	0.50	2.83	20	4.1	1.9	14.7	M
	90	06/26/94	59.639	-168.606	37	06	0.49	2.24	20	4.9	0.3	14.9	M
*	91	06/26/94	59.655	-167.968	33	09	0.33	1.82	20	3.7	0.3	15.6	F
*	92	06/26/94	59.989	-167.958	22	11	0.50	2.61	20	4.3	3.7	15.4	M
	93	06/26/94	60.001	-168.602	37	14	0.49	2.67	20	4.9	-0.5	14.7	M
*	94	06/26/94	60.311	-168.682	33	16	0.50	2.61	20	2.8	1.0	15.5	M
*	95	06/27/94	60.341	-169.333	40	06	0.49	2.67	20	5.2	-1.3	16.3	M
*	96	06/27/94	60.007	-169.317	42	08	0.50	2.74	20	4.7	-1.5	16.2	M
*	97	06/27/94	59.690	-169.263	46	11	0.50	2.70	20	5.0	0.7	15.8	M
*	98	06/27/94	59.354	-169.229	48	13	0.50	2.59	20	4.6	0.5	16.2	M
*	99	06/27/94	59.016	-169.163	51	15	0.50	2.83	41	5.4	0.3	15.8	M
*	100	06/28/94	58.676	-169.149	60	06	0.50	2.67	41	5.5	-1.2	17.0	M
*	101	06/28/94	58.340	-169.111	66	09	0.50	2.76	41	5.9	-1.1	16.0	M
*	102	06/28/94	58.021	-169.070	70	11	0.50	2.76	42	6.1	-1.0	16.3	M



Table A-2.--Continued.

Haul	MM/DD/YY	Latitude	Longitude	Depth (m)	Time Duration (hr.)	Duration (hr.)	Distance (km)	Strata	Surf. Temp.	Gear. Temp.	Net Width (m)	Width Code
* 103	06/28/94	57.835	-168.744	70	13	0.50	2.63	42	6.2	-0.3	16.6	M
* 104	06/28/94	57.679	-169.009	68	15	0.52	2.83	42	6.1	-1.0	16.4	M
* 105	06/29/94	57.501	-168.751	70	06	0.50	2.63	42	5.9	-0.2	16.4	M
* 106	06/29/94	57.334	-168.990	68	08	0.50	2.50	42	6.3	2.2	15.9	M
* 107	06/29/94	57.170	-168.631	73	11	0.33	1.80	32	6.3	2.4	16.8	M
* 108	06/29/94	57.008	-168.932	77	13	0.33	1.82	32	6.6	2.4	17.0	M
* 109	06/29/94	56.837	-168.620	95	15	0.49	2.46	32	7.1	2.7	17.9	M
* 110	06/29/94	56.678	-168.905	99	16	0.50	2.89	32	6.9	2.5	17.6	F
* 111	06/30/94	56.318	-170.040	108	07	0.47	2.63	50	5.9	3.3	18.1	M
* 112	06/30/94	56.646	-170.096	95	09	0.50	2.87	42	5.4	3.2	18.4	M
* 113	06/30/94	56.818	-169.852	73	11	0.51	2.89	42	5.0	3.5	17.3	M
* 114	06/30/94	56.997	-170.170	68	13	0.50	2.91	42	6.1	1.8	17.3	M
* 115	06/30/94	57.153	-169.883	48	15	0.50	2.61	42	4.8	2.3	15.7	M
* 116	07/01/94	57.310	-170.200	49	06	0.50	2.46	42	4.2	2.5	15.5	M
* 117	07/01/94	57.484	-169.980	64	08	0.34	1.95	42	5.3	0.9	17.0	M
* 118	07/01/94	57.651	-170.255	71	10	0.33	1.96	42	5.7	1.1	17.3	M
* 119	07/01/94	57.817	-169.974	71	12	0.49	2.87	42	5.9	-1.4	17.1	M
* 120	07/01/94	57.988	-170.320	73	14	0.49	2.65	42	5.9	-1.6	17.5	M
* 121	07/01/94	58.316	-170.381	73	16	0.50	2.76	41	6.0	-1.6	17.7	M
* 122	07/02/94	58.657	-170.433	73	06	0.50	2.54	41	5.6	-1.8	17.5	M
* 123	07/02/94	58.994	-170.476	70	08	0.50	2.78	41	5.3	-1.8	17.0	M
* 124	07/02/94	59.325	-170.530	66	11	0.51	2.87	41	5.7	-1.7	17.5	M
* 125	07/02/94	59.655	-170.572	66	13	0.50	2.76	41	6.0	-1.7	16.8	F
* 126	07/02/94	59.996	-170.628	64	15	0.50	2.83	41	5.9	-2.0	17.7	M
* 127	07/03/94	60.333	-170.643	60	06	0.50	2.41	41	5.3	-2.0	17.5	M
* 128	07/03/94	60.330	-171.338	64	08	0.50	2.70	41	4.7	-2.1	17.8	M
* 129	07/03/94	60.332	-172.027	59	11	0.50	2.65	43	5.4	-2.0	17.0	M
* 130	07/03/94	60.176	-172.319	55	13	0.50	2.67	43	5.7	-1.1	17.1	M
* 131	07/03/94	60.009	-172.639	64	15	0.50	2.57	43	5.7	-1.9	17.3	M
* 132	07/03/94	59.854	-172.899	77	16	0.50	2.72	43	5.7	-1.8	17.2	F
* 133	07/04/94	59.678	-172.566	84	06	0.50	2.52	43	6.2	-1.3	17.3	M
* 134	07/04/94	59.509	-172.863	93	08	0.51	2.67	43	5.9	-1.0	17.7	M
* 135	07/04/94	59.342	-172.501	88	10	0.50	2.59	43	6.6	-1.2	17.6	M
* 136	07/04/94	59.010	-172.433	97	13	0.50	2.78	41	6.4	-0.3	16.5	M

Table A-2.--Continued.

Haul	MM/DD/YY	Latitude	Longitude	Depth (m)	Time (hr.)	Duration (hr.)	Distance (km)	Strata	Surf. Temp.	Gear. Temp.	Net Width (m)	Width Code
* 137	07/04/94	58.682	-172.365	101	15	0.50	2.74	61	6.3	0.2	16.7	M
* 138	07/04/94	58.345	-172.294	106	17	0.50	2.63	61	6.2	0.5	17.1	M
* 141	07/06/94	57.985	-172.234	104	10	0.38	1.93	61	6.3	0.7	18.0	M
* 142	07/06/94	57.683	-172.169	106	12	0.50	2.61	61	6.9	1.2	18.1	M
* 143	07/06/94	57.352	-172.097	108	15	0.50	2.63	61	7.1	1.5	18.1	M
* 144	07/06/94	57.036	-172.032	115	17	0.50	2.61	61	7.2	2.0	17.9	M
* 145	07/06/94	56.684	-171.958	124	20	0.50	2.80	61	7.2	2.9	18.2	F
* 146	07/07/94	56.994	-173.251	141	06	0.50	2.82	61	7.1	3.1	18.2	F
* 147	07/07/94	57.326	-173.328	121	08	0.50	2.80	61	7.5	2.5	17.9	F
* 148	07/07/94	57.656	-173.401	143	11	0.50	2.82	61	7.4	2.7	18.2	F
* 149	07/07/94	57.992	-173.485	117	13	0.50	2.95	61	7.3	1.7	17.9	F
* 150	07/07/94	58.329	-173.572	115	16	0.50	2.93	61	7.1	2.2	19.0	M
* 151	07/08/94	58.664	-173.638	126	06	0.50	2.69	61	7.2	2.3	18.2	M
* 152	07/08/94	58.982	-173.719	117	08	0.50	2.89	61	6.6	1.8	18.5	M
* 153	07/08/94	59.327	-173.804	110	11	0.50	2.63	62	5.9	0.7	18.4	M
* 154	07/08/94	59.479	-173.520	102	13	0.50	2.57	43	6.2	0.4	18.2	M
* 155	07/08/94	59.652	-173.851	104	15	0.50	2.83	62	6.1	0.0	18.5	M
* 156	07/08/94	59.817	-174.209	106	17	0.50	2.89	62	5.9	0.0	18.4	M
* 157	07/09/94	59.991	-173.972	97	06	0.48	2.56	43	6.1	-0.5	18.2	M
* 158	07/09/94	60.116	-173.747	88	07	0.50	2.65	43	6.0	-1.0	18.0	M
* 159	07/09/94	60.164	-174.308	99	10	0.50	2.69	43	6.2	-0.3	18.4	M
* 160	07/09/94	60.313	-174.108	91	12	0.50	2.82	43	6.5	-1.2	18.6	M
* 161	07/09/94	60.647	-174.127	86	14	0.51	3.13	41	6.1	-2.0	18.5	M
* 162	07/10/94	60.664	-175.417	106	06	0.50	2.61	61	5.5	-0.2	19.1	M
* 163	07/10/94	60.343	-175.385	112	08	0.50	2.70	61	5.4	0.3	18.6	M
* 164	07/10/94	60.013	-175.270	117	11	0.49	2.72	61	6.1	1.0	17.9	F
* 165	07/10/94	59.683	-175.119	123	13	0.51	2.74	61	6.1	1.4	18.7	M
* 166	07/10/94	59.354	-175.057	132	16	0.50	2.65	61	6.7	1.5	18.7	M
* 167	07/11/94	59.017	-175.005	130	06	0.50	2.54	61	6.0	1.8	18.4	M
* 168	07/11/94	58.706	-174.877	177	09	0.50	2.69	61	6.7	2.6	18.7	F
* 180	07/20/94	61.028	-174.187	80	13	0.34	1.67	41	7.6	-2.1	17.6	M
* 186	07/22/94	60.683	-178.173	161	10	0.50	2.76	61	6.9	1.3	18.7	M
* 187	07/22/94	60.675	-177.542	146	12	0.50	2.78	61	7.0	1.3	18.5	F
* 188	07/22/94	60.357	-177.393	150	15	0.50	2.70	61	6.6	1.4	18.3	M

Table A-2.--Continued.

Haul	MM/DD/YY	Latitude	Longitude	Depth (m)	Time Duration (hr.)	Duration (hr.)	Distance (km)	Strata	Surf. Temp.	Gear. Temp.	Net Width (m)	Width Code
* 189	07/22/94	60.334	-176.774	139	18	0.50	2.78	61	6.8	1.6	17.7	M
* 190	07/23/94	59.999	-177.220	137	08	0.50	2.54	61	6.9	1.9	18.2	F
191	07/23/94	60.003	-177.889	141	10	0.50	2.72	61	6.9	1.6	18.2	F
192	07/23/94	59.671	-177.192	177	13	0.50	2.65	61	7.8	2.4	18.7	F
* 193	07/23/94	59.665	-176.569	135	16	0.50	2.65	61	7.3	1.7	18.2	F
* 194	07/23/94	59.345	-177.053	150	19	0.50	2.80	61	7.6	2.4	18.5	M
195	07/24/94	59.000	-177.655	135	07	0.50	2.63	61	6.9	2.7	18.3	M
* 196	07/24/94	59.000	-176.992	135	10	0.49	2.74	61	7.5	2.6	18.6	M
* 197	07/24/94	58.688	-176.832	134	12	0.50	2.83	61	8.2	3.2	18.6	M
* 198	07/26/94	56.332	-168.887	130	07	0.51	2.82	50	9.5	4.1	18.2	F

APPENDIX B

List of Species Encountered

Appendix B contains a listing of all fish and invertebrate species taken during the 1994 eastern Bering Sea bottom trawl survey.

List of Tables

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B-2. Invertebrate species encountered.....	107

Table B-1.--Fish species encountered during the 1994 U.S. eastern Bering Sea bottom trawl survey.

Common name	Scientific name
Family Squalidae Pacific sleeper shark	<u>Somniosus pacificus</u>
Family Rajidae skate unident.	<u>Rajidae unident.</u>
Family Pleuronectidae arrowtooth flounder Kamchatka flounder Greenland turbot Pacific halibut flathead sole Bering flounder rex sole yellowfin sole longhead dab Sakhalin sole starry flounder northern rock sole butter sole Alaska plaice Dover sole	<u>Atheresthes stomias</u> <u>Atheresthes evermanni</u> <u>Reinhardtius hippoglossoides</u> <u>Hippoglossus stenolepis</u> <u>Hippoglossoides elassodon</u> <u>Hippoglossoides robustus</u> <u>Glyptocephalus zachirus</u> <u>Limanda asper</u> <u>Limanda proboscidea</u> <u>Limanda sakhalinensis</u> <u>Platichthys stellatus</u> <u>Lepidopsetta sp.</u> <u>Isopsetta isolepis</u> <u>Pleuronectes quadrituberculatus</u> <u>Microstomus pacificus</u>
Family Agonidae tubenose poacher sawback poacher sturgeon poacher Aleutian alligatorfish Arctic alligatorfish Bering poacher dragon poacher	<u>Pallasina barbata</u> <u>Sarritor frenatus</u> <u>Podothecus acipenserinus</u> <u>Aspidophoroides bartoni</u> <u>Aspidophoroides olriki</u> <u>Ocella dodecaedron</u> <u>Percis japonicus</u>
Family Ammodytidae Pacific sand lance	<u>Ammodytes hexapterus</u>
Family Anarrhichadidae wolf-eel Bering wolffish	<u>Anarrhichthys ocellatus</u> <u>Anarrhichas orientalis</u>
Family Bathymasteridae searcher	<u>Bathymaster signatus</u>

Table B-1.--Continued.

Common name	Scientific name
Family Clupeidae	
Pacific herring	<u>Clupea pallasii</u>
Family Cottidae	
<u>Gymnocanthus</u> unident.	<u>Gymnocanthus</u> sp.
armorhead sculpin	<u>Gymnocanthus galeatus</u>
<u>Artediellus</u> unident.	<u>Artediellus</u> sp.
Pacific hookear sculpin	<u>Artediellus pacificus</u>
<u>Malacocotus</u> unident.	<u>Malacocottus</u> sp.
yellow Irish lord	<u>Hemilepidotus jordani</u>
butterfly sculpin	<u>Hemilepidotus papilio</u>
<u>Triglops</u> unident.	<u>Triglops</u> sp.
<u>Myoxocephalus</u> unident.	<u>Myoxocephalus</u> sp.
great sculpin	<u>Myoxocephalus polyacanthocephalus</u>
plain sculpin	<u>Myoxocephalus jaok</u>
spinyhead sculpin	<u>Dasycottus setiger</u>
bigmouth sculpin	<u>Hemitripterus bolini</u>
thorny sculpin	<u>Icelus spiniger</u>
<u>Icelus</u> unident.	<u>Icelus</u> sp.
Family Trichodontidae	
Pacific sandfish	<u>Trichodon trichodon</u>
Family Gadidae	
Pacific cod	<u>Gadus macrocephalus</u>
Arctic cod	<u>Boreogadus saida</u>
saffron cod	<u>Eleginus gracilis</u>
walleye pollock	<u>Theragra chalcogramma</u>
Family Hexagrammidae	
atka mackerel	<u>Pleurogrammus monopterygius</u>
whitespotted greenling	<u>Hexagrammos stelleri</u>
Family Cyclopteridae	
lumpsucker unident.	Cyclopteridae
smooth lumpsucker	<u>Aptocyclus ventricosus</u>
Pacific spiny lumpsucker	<u>Eumicrotremus orbis</u>
snailfish unident.	Cyclopteridae
<u>Liparis</u> unident.	<u>Liparis</u> sp.
<u>Careproctus</u> unident.	<u>Careproctus</u> sp.
monster snailfish	<u>Careproctus phasma</u>
Family Osmeridae	
eulachon	<u>Thaleichthys pacificus</u>
capelin	<u>Mallotus villosus</u>
rainbow smelt	<u>Osmerus mordax</u>

Table B-1.--Continued.

Common name	Scientific name
Family Salmonidae	
chum salmon	<u>Oncorhynchus keta</u>
coho salmon	<u>Oncorhynchus kisutch</u>
sockeye salmon	<u>Oncorhynchus nerka</u>
Family Stichaeidae	
prickleback unident.	Stichaeidae
daubed shanny	<u>Lumpenus maculatus</u>
snake prickleback	<u>Lumpenus sagitta</u>
slender eelblenny	<u>Lumpenus fabricii</u>
Family Zaproridae	
prowfish	<u>Zaprora silenus</u>
Family Zoarcidae	
<u>Lycodes</u> unident.	<u>Lycodes</u> sp.
marbled eelpout	<u>Lycodes raridens</u>
wattled eelpout	<u>Lycodes palearis</u>
shortfin eelpout	<u>Lycodes brevipes</u>
Family Scorpaenidae	
Pacific ocean perch	<u>Sebastes alutus</u>
light dusky rockfish	<u>Sebastes ciliatus</u>
northern rockfish	<u>Sebastes polyspinis</u>
roughey rockfish	<u>Sebastes aleutianus</u>

Table B-2.--Invertebrate species encountered during the 1993 U.S. eastern Bering Sea bottom trawl survey.

Common name	Scientific name
<b>Phylum Porifera</b>	
Sponge unident.	Porifera (phylum)
Barrel sponge	<u>Halichondria panicea</u>
<b>Phylum Coelenterata</b>	
Sea anemone unident.	Actinaria (order)
<u>Metridium</u> unident.	<u>Metridium</u> sp.
<u>Tealia</u> unident.	<u>Tealia</u> sp.
Sea raspberry	<u>Gersemia rubiformis</u>
Sea pen unident.	Pennatulacea (order)
Jellyfish unident.	Scyphozoa (class)
<b>Phylum Mollusca</b>	
<b>Gastropods</b>	
Nudibranch unident.	Onchidoridae (family)
Rosy tritonia	<u>Tritonia diomedea</u>
<u>Aforia</u> unident.	<u>Aforia</u> sp.
Keeled aforia	<u>Aforia circinata</u>
Alaska volute	<u>Arctomelon stearnsii</u>
<u>Beringius</u> unident.	<u>Beringius</u> sp.
Northern beringius	<u>Beringius beringii</u>
Kennicott's beringius	<u>Beringius kennicottii</u>
Stimpson's beringius	<u>Beringius stimpsoni</u>
Angled whelk	<u>Buccinum angulosum</u>
Sinuous whelk	<u>Buccinum plectrum</u>
Polar whelk	<u>Buccinum polare</u>
Ladder (silky) whelk	<u>Buccinum scalariforme</u>
<u>Buccinum</u> unident.	<u>Buccinum</u> sp.
<u>Colus</u> unident.	<u>Colus</u> sp.
Thin-ribbed whelk	<u>Colus herendeenii</u>
Hall's colus	<u>Colus halli</u>
Oregon triton	<u>Fusitriton oregonensis</u>
<u>Fusitriton</u> unident.	<u>Fusitriton</u> sp.
Snail unident.	Gastropoda (phylum)
<u>Natica</u> unident.	<u>Natica</u> sp.
Little neptune	<u>Neptunea borealis</u>
Northern neptune	<u>Neptunea heros</u>
Lyre whelk	<u>Neptunea lyrata</u>
Helmet whelk	<u>Neptunea magma</u>
Pribilof whelk	<u>Neptunea pribiloffensis</u>
Fat whelk	<u>Neptunea ventricosa</u>
Kroyer's plicifus	<u>Plicifusus kroyeri</u>



Table B-2.--Continued.

Common name	Scientific name
Gastropods (cont'd)	
Snail (gastropod) eggs	Snail (gastropod) eggs
Warped whelk	<u>Pyrulofusus deformis</u>
Large melon snail	<u>Pyrulofusus melonis</u>
Fragile whelk	<u>Volutopsius fragilis</u>
Tulip whelk	<u>Volutopsius middendorffii</u>
<u>Volutopsius</u> unident.	<u>Volutopsius</u> sp.
Bivalves	
Bivalve unident.	Bivalvia (class)
Cockle unident.	Cardiidae (family)
<u>Chlamys</u> unident.	<u>Chlamys</u> sp.
Reddish scallop	<u>Chlamys rubida</u>
<u>Clinocardium</u> unident.	<u>Clinocardium</u> sp.
Iceland cockle	<u>Clinocardium ciliatum</u>
Nuttall's cockle	<u>Clinocardium nuttallii</u>
<u>Cyclocardia</u> unident.	<u>Cyclocardia</u> sp.
Many-ribbed cyclocardia	<u>Cyclocardia crebricostata</u>
<u>Macoma</u> unident.	<u>Macoma</u> sp.
Artic surfclam	<u>Mactromeris polynyma</u>
<u>Mactromeris</u> unident.	<u>Mactromeris</u> sp.
Blue mussel	<u>Mytilus edulis</u>
<u>Nuculana</u> unident.	<u>Nuculana</u> sp.
Weatherwane scallop	<u>Patinopectin caurinus</u>
Scallop unident.	Pectinidae (family)
Alaska falsejingle	<u>Pododesmus macroschisma</u>
<u>Serripes</u> unident.	<u>Serripes</u> sp.
Greenland cockle	<u>Serripes groenlandicus</u>
La Perouse's cockle	<u>Serripes laperousii</u>
<u>Siliqua</u> unident.	<u>Siliqua</u> sp.
Alaska razor clam	<u>Siliqua alta</u>
Crisscrossed yoldia	<u>Yoldia scissurata</u>
<u>Tellina</u> unident.	<u>Tellina</u> sp.
Alaska great-tellin	<u>Tellin lutea</u>
Cephalopods	
Octopus unident.	Octopodidae (family)
Squid unident.	Teuthoidea (order)
Phylum Annelida	
Sea mouse unident.	Aphroditidae (family)
Sea mouse	<u>Aphrodita negligens</u>
Giant scale worm	<u>Eunoe nodosa</u>
Tube worm unident.	Polychaeta (class)
Phylum Arthropoda	
Giant barnacle	<u>Balanus evermanni</u>

Table B-2.--Continued.

Common name	Scientific name
<b>Crab</b>	
Dungeness crab	<u>Cancer magister</u>
Oregon rock crab	<u>Cancer oregonensis</u>
Broad snow crab	<u>Chionoecetes bairdi</u>
Tanner crab	<u>Chionoecetes hybrid</u>
Narrow snow crab	<u>Chionoecetes opilio</u>
Horsehair crab	<u>Erimacrus isenbeckii</u>
Circumboreal toad crab	<u>Hyas coarctatus</u>
North Pacific toad crab	<u>Hyas lyratus</u>
<u>Hyas</u> unident.	<u>Hyas</u> sp.
Graceful decorator crab	<u>Oregonia gracilis</u>
Hermit crab unident.	Paguridae (family)
Red king crab	<u>Paralithodes camtschaticus</u>
Blue king crab	<u>Paralithodes platypus</u>
Helmet crab	<u>Telmessus cheiragonus</u>
<b>Shrimp</b>	
Arctic argid .	<u>Argis dentata</u>
Northern argid	<u>Argis lar</u>
<u>Argis</u> unident.	<u>Argis</u> sp.
<u>Crangon</u> unident.	<u>Crangon</u> sp.
Ridged crangon	<u>Crangon dalli</u>
<u>Eualus</u> unident.	<u>Eualus</u> sp.
Hippolytid shrimp unident.	Hippolytidae (family)
Spiny lebbeid	<u>Lebbeus groenlandicus</u>
Northern (pink) shrimp	<u>Pandalus borealis</u>
Humpy shrimp	<u>Pandalus goniurus</u>
<u>Pandalus</u> unident.	<u>Pandalus</u> sp.
Scultured shrimp	<u>Sclerocrangon boreas</u>
Shrimp unident.	Penaeidea (Section)
<b>Phylum Sipuncula</b>	
Sipunculid worm unident.	Sipuncula (phylum)
<b>Phylum Bryozoa</b>	
Bryozoan unident.	Bryozoa (phylum)
Leafy bryozoan	<u>Flustra serrulata</u>
Ribbed bryozoan	<u>Rhamphostomella costata</u>
Coral bryozoan	<u>Cellepora ventricosa</u>
Feathery bryozoan	<u>Eucratea loricata</u>
<b>Phylum Echinodermata</b>	
<b>Holothuroidea</b>	
Sea football	<u>Cucumaria fallax</u>
<u>Cucumaria</u> unident.	<u>Cucumaria</u> sp.
Sea cucumber unident	Holothuroidea (class)
Redscaled sea cucumber	<u>Psolus</u> sp.

Table B-2.--Continued.

Common name	Scientific name
Holothuroidea (cont'd)	
Echinoidea	
Sand dollar unident.	Clypeasteroidea (order)
Sea urchin unident.	Sea urchin unident.
Green sea urchin	<u>Strongylocentrotus droebachiensis</u>
Asteroidea	
<u>Asterias</u> unident.	<u>Asterias</u> sp.
Purple-orange sea star	<u>Asterias amurensis</u>
Starfish unident.	Asteroidea (subclass)
Red bat star	<u>Ceramaster japonicus</u>
<u>Crossaster</u> unident.	<u>Crossaster</u> sp.
Rose sea star	<u>Crossaster papposus</u>
Common mud star	<u>Ctenodiscus crispatus</u>
<u>Ctenodiscus</u> unident.	<u>Ctenodiscus</u> sp.
Pincushion sea star	<u>Diplopteraster multipes</u>
<u>Evasterias</u> unident.	<u>Evasterias</u> sp.
Giant sea star	<u>Evasterias echinosoma</u>
<u>Henricia</u> unident.	<u>Henricia</u> sp.
Arctic sea star	<u>Leptasterias arctica</u>
Knobless six-rayed sea star	<u>Leptasterias hexactis</u>
Knobby six-rayed sea star	<u>Leptasterias polaris</u>
<u>Leptasterias</u> unident.	<u>Leptasterias</u> sp.
Blackspined sea star	<u>Lethasterias nanimensis</u>
Scarlet sea star	<u>Pseudarchaster parelii</u>
Cushion sea star	<u>Pteraster tessellatus</u>
Obscure sea star	<u>Pteraster obscurus</u>
<u>Pteraster</u> unident.	<u>Pteraster</u> sp.
Twentyarm sea star	<u>Pycnopodia helianthoides</u>
<u>Solaster</u> unident.	<u>Solaster</u> sp.
	<u>Solaster dawsoni</u>
Ophiuroidea	
Basket star	<u>Gorgonocephalus caryi</u>
Notched brittlestar	<u>Ophiura sarsi</u>
Brittlestarfish unident.	Ophiuroidea (subclass)
Phylum Chordata	
<u>Aplidium</u> unident.	<u>Aplidium</u> sp.
Tunicate unident.	Ascidian unident.
Sea onion	<u>Boltenia ovifera</u>
Sea onion unident.	<u>Boltenia</u> sp.
Compound ascidian unident.	Compound ascidian unident.
Sea peach	<u>Halocynthia aurantium</u>
Sea potato	<u>Styela rustica</u>

APPENDIX C

Rank Order of Relative Abundance of Fish and Invertebrates

Appendix C ranks all fish and invertebrates caught during the 1994 eastern Bering Sea Bottom trawl survey by descending CPUE (kg/ha).

Table C-1.--Rank order of fish and invertebrate taxa by relative abundance (kg/ha) from the 1994 eastern Bering Sea bottom trawl survey.

RANK	SPECIES	MEAN CPUE (KG/HA)	VARIANCE	95 PERCENT CONFIDENCE LIMITS		PROPORTION	CUMULATIVE PROPORTION	NAME
1	21740	106.14218	122.077	84.48641	127.79795	0.27189600	0.27189600	Theragra chalcogramma
2	10260	66.92875	58.793	51.90018	81.95732	0.17144600	0.44334200	Lepidopsetta sp.
3	10210	56.51494	23.654	46.98233	66.04756	0.14477000	0.58811200	Pleuronectes asper
4	21720	30.35881	24.454	20.66636	40.05125	0.07776800	0.66587901	Gadus macrocephalus
5	81742	21.65860	3.683	17.89705	25.42014	0.05548100	0.72136003	Asterias amurensis
6	10130	15.09661	1.511	12.68708	17.50614	0.03867200	0.76003200	Hippoglossoides sp.
7	10285	13.73091	1.627	11.23066	16.23117	0.03517300	0.79520500	Pleuronectes quadrituberculatus
8	10110	11.58066	1.535	9.15230	14.00903	0.02966500	0.82487100	Atheresthes sp.
9	400	9.05430	0.588	7.55090	10.55770	0.02319400	0.84806401	Rajidae unident.
10	68580	8.73997	0.798	6.98914	10.49080	0.02238800	0.87045300	Chionoecetes opilio
11	69010	8.02936	0.461	6.69810	9.36062	0.02056800	0.89102101	Paguridae
12	10120	3.55681	0.061	3.07183	4.04179	0.00911100	0.90013200	Hippoglossus stenolepis
13	40500	3.47625	0.605	1.95235	5.00015	0.00890500	0.90903699	Scyphozoa (class)
14	91000	3.02474	1.439	0.67366	5.37581	0.00774800	0.91678500	Porifera
15	98082	2.96829	0.460	1.63921	4.29736	0.00760400	0.92438900	Styela rustica
16	21370	2.15708	0.056	1.69161	2.62255	0.00552600	0.92991400	Myoxocephalus polyacanthocephalus
17	83020	1.98433	0.081	1.42537	2.54328	0.00508300	0.93499798	Gorgonocephalus caryi
18	71884	1.78217	0.067	1.27421	2.29013	0.00456500	0.93956298	Neptunea heros
19	68560	1.33049	0.030	0.99214	1.66883	0.00340800	0.94297099	Chionoecetes bairdi
20	71820	1.17564	0.034	0.81580	1.53549	0.00301200	0.94598299	Neptunea pribiloffensis
21	69322	1.09187	0.127	0.39323	1.79050	0.00279700	0.94877899	Paralithodes camtschaticus
22	43000	1.04046	0.050	0.60104	1.47989	0.00266500	0.95144498	Actiniaria (order)
23	98310	1.00103	0.128	0.30056	1.70151	0.00256400	0.95400900	Aplidium sp.
24	10115	0.96906	0.055	0.50980	1.42831	0.00248200	0.95649099	Reinhardtius hippoglossoides
25	21371	0.94024	0.025	0.63185	1.24862	0.00240900	0.95889997	Myoxocephalus jaok
26	71870	0.83393	0.034	0.47282	1.19504	0.00213600	0.96103603	Neptunea lyrata
27	83010	0.81047	0.096	0.20338	1.41756	0.00207600	0.96311200	Basketstarfish unident.
28	98205	0.80419	0.082	0.24222	1.36617	0.00206000	0.96517199	Halocynthia aurantium
29	21110	0.74025	0.111	0.08732	1.39317	0.00189600	0.96706802	Clupea pallasii
30	71882	0.72281	0.013	0.50301	0.94260	0.00185200	0.96891999	Neptunea ventricosa
31	20040	0.69799	0.009	0.51427	0.88170	0.00178800	0.97070801	Podothecus acipenserinus
32	80590	0.66698	0.013	0.44517	0.88879	0.00170900	0.97241700	Leptasterias polaris

Table C-1.--Continued.

RANK	SPECIES	MEAN CPUE (KG/HA)	VARIANCE	95 PERCENT CONFIDENCE LIMITS		PROPORTION	CUMULATIVE PROPORTION	NAME
33	21420	0.65874	0.028	0.33259	0.98488	0.00168700	0.97410399	Hemitripteris bolini
34	68577	0.62332	0.030	0.28419	0.96245	0.00159700	0.97570097	Hyas coarctatus
35	21347	0.54012	0.030	0.20339	0.87684	0.00138400	0.97708398	Hemilepidotus jordani
36	69323	0.49888	0.016	0.25351	0.74424	0.00127800	0.97836202	Paralithodes platypus
37	10211	0.38940	0.012	0.17639	0.60242	0.00099800	0.97935998	Limanda proboscidea
38	98100	0.38501	0.010	0.18956	0.58046	0.00098600	0.98034602	Boltenia sp.
39	10220	0.38277	0.009	0.19909	0.56645	0.00098100	0.98132598	Platichthys stellatus
40	24191	0.36261	0.009	0.17312	0.55209	0.00092900	0.98225498	Lycodes brevipes
41	72500	0.34921	0.007	0.18141	0.51700	0.00089500	0.98315001	Fusitriton oregonensis
42	83000	0.33700	0.024	0.03175	0.64224	0.00086300	0.98401302	Ophiuroid unident.
43	81779	0.32825	0.017	0.06982	0.58668	0.00084100	0.98485398	Ctenodiscus sp.
44	80200	0.31504	0.004	0.19198	0.43809	0.00080700	0.98566097	Lethasterias nanimensis
45	21348	0.31007	0.012	0.09222	0.52792	0.00079400	0.98645502	Hemilepidotus papilio
46	10200	0.30566	0.014	0.07173	0.53958	0.00078300	0.98723799	Glyptocephalus zachirus
47	24184	0.29139	0.005	0.15056	0.43223	0.00074600	0.98798501	Lycodes raridens
48	71753	0.27539	0.014	0.04714	0.50363	0.00070500	0.98869002	Pyrulofusus deformis
49	24185	0.27117	0.003	0.16876	0.37359	0.00069500	0.98938501	Lycodes palearis
50	21316	0.17393	0.009	0.00000	0.36098	0.00044600	0.98983002	Gymnocanthus galeatus
51	71500	0.16700	0.002	0.07757	0.25643	0.00042800	0.99025798	Gastropod unident.
52	80594	0.16678	0.015	0.00000	0.40907	0.00042700	0.99068499	Leptasterias arctica
53	83320	0.16129	0.004	0.03093	0.29164	0.00041300	0.99109799	Ophiura sarsi
54	68578	0.15854	0.002	0.08064	0.23645	0.00040600	0.99150503	Hyas lyratus
55	41201	0.15756	0.001	0.08500	0.23012	0.00040400	0.99190801	Gersemia sp.
56	71750	0.15281	0.002	0.06643	0.23919	0.00039100	0.99229997	Volutopsius sp.
57	69400	0.13472	0.001	0.06598	0.20346	0.00034500	0.99264503	Erimacrus isenbeckii
58	21725	0.12861	0.001	0.08378	0.17344	0.00032900	0.99297398	Boreogadus saida
59	20720	0.12498	0.002	0.04573	0.20423	0.00032000	0.99329400	Bathymaster signatus
60	98105	0.11361	0.012	0.00000	0.33209	0.00029100	0.99358499	Boltenia ovifera
61	82500	0.11113	0.001	0.03715	0.18510	0.00028500	0.99387002	sea urchin unident.
62	72740	0.10372	0.001	0.04954	0.15790	0.00026600	0.99413598	Buccinum sp.
63	71001	0.09978	0.000	0.06090	0.13865	0.00025600	0.99439102	snail (gastropod) eggs
64	23010	0.09605	0.002	0.00694	0.18517	0.00024600	0.99463701	Thaleichthys pacificus
65	320	0.09580	0.006	0.00000	0.24924	0.00024500	0.99488300	Somniosus pacificus
66	80020	0.09343	0.001	0.04089	0.14597	0.00023900	0.99512202	Evasterias echinosoma

Table C-1.--Continued.

RANK	SPECIES	MEAN CPUE (KG/HA)	VARIANCE	95 PERCENT CONFIDENCE LIMITS		PROPORTION	CUMULATIVE PROPORTION	NAME
67	85201	0.09067	0.003	0.00000	0.19307	0.00023200	0.99535400	Cucumaria fallax
68	95000	0.08364	0.002	0.00000	0.17962	0.00021400	0.99556899	bryozoan unident.
69	72752	0.07409	0.000	0.05171	0.09647	0.00019000	0.99575800	Buccinum scalariforme
70	66031	0.07268	0.000	0.04208	0.10328	0.00018600	0.99594498	Pandalus borealis
71	72755	0.07060	0.000	0.03945	0.10176	0.00018100	0.99612498	Buccinum polare
72	74120	0.06893	0.003	0.00000	0.17598	0.00017700	0.99630201	Patinopecten caurinus
73	85200	0.05577	0.001	0.00000	0.11518	0.00014300	0.99644500	Cucumaria sp.
74	68781	0.05551	0.000	0.01860	0.09242	0.00014200	0.99658698	Telmessus cheiragonus
75	72743	0.05139	0.000	0.03069	0.07209	0.00013200	0.99671900	Buccinum angulosum
76	78010	0.04912	0.001	0.00358	0.09465	0.00012600	0.99684501	octopus unident.
77	21446	0.04532	0.000	0.00441	0.08622	0.00011600	0.99696100	Icelus sp.
78	81741	0.04309	0.002	0.00000	0.12755	0.00011000	0.99707103	Asterias sp.
79	81780	0.04136	0.000	0.01493	0.06778	0.00010600	0.99717700	Ctenodiscus crispatus
80	85000	0.03763	0.001	0.00000	0.09315	0.00009600	0.99727303	Holothuroidea unident.
81	23235	0.03735	0.000	0.00017	0.07454	0.00009600	0.99736899	Oncorhynchus keta
82	71756	0.03733	0.000	0.00189	0.07278	0.00009600	0.99746501	Volutopsius fragilis
83	68590	0.03581	0.000	0.01862	0.05301	0.00009200	0.99755597	Chionoecetes hybrid
84	71835	0.03394	0.000	0.01879	0.04909	0.00008700	0.99764299	Neptunea borealis
85	82510	0.03212	0.000	0.00713	0.05711	0.00008200	0.99772602	Strongylocentrotus droebachiensis
86	23041	0.03195	0.000	0.02286	0.04103	0.00008200	0.99780703	Mallotus villosus
87	21390	0.02987	0.000	0.01705	0.04268	0.00007700	0.99788398	Dasycottus setiger
88	22200	0.02971	0.000	0.01728	0.04213	0.00007600	0.99795997	Cyclopteridae (Liparidinae)
89	98300	0.02962	0.000	0.00655	0.05269	0.00007600	0.99803603	compound ascidian unident.
90	50160	0.02944	0.000	0.00361	0.05527	0.00007500	0.99811101	Aphroditidae
91	82730	0.02853	0.000	0.00560	0.05146	0.00007300	0.99818403	sand dollar unident.
92	71761	0.02751	0.000	0.00000	0.06946	0.00007000	0.99825501	Pyrulofusus melonis
93	20322	0.02463	0.000	0.00000	0.05156	0.00006300	0.99831802	Anarhichas orientalis
94	56311	0.02355	0.000	0.01177	0.03534	0.00006000	0.99837798	Eunoe nodosa
95	71886	0.02310	0.000	0.01109	0.03510	0.00005900	0.99843699	Neptunea magna
96	71891	0.02278	0.000	0.01246	0.03309	0.00005800	0.99849600	Plicifusus kroyeri
97	98000	0.02270	0.000	0.00291	0.04249	0.00005800	0.99855399	Ascidian unident.
98	10270	0.02252	0.000	0.00000	0.06534	0.00005800	0.99861199	Isopsetta isolepis
99	71030	0.02234	0.000	0.00000	0.05388	0.00005700	0.99866903	Tritonia diomedea
100	22201	0.02063	0.000	0.00703	0.03422	0.00005300	0.99872202	Liparis sp.

Table C-1.--Continued.

RANK	SPECIES	MEAN CPUE (KG/HA)	VARIANCE	95 PERCENT CONFIDENCE LIMITS		PROPORTION	CUMULATIVE PROPORTION	NAME
101	24001	0.01964	0.000	0.00000	0.05699	0.00005000	0.99877203	Zaprora silenus
102	81355	0.01964	0.000	0.00759	0.03169	0.00005000	0.99882197	Pteraster obscurus
103	75111	0.01624	0.000	0.00669	0.02578	0.00004200	0.99886400	Mactromeris polynyma
104	72751	0.01603	0.000	0.00012	0.03195	0.00004100	0.99890500	Buccinum plectrum
105	22219	0.01442	0.000	0.00550	0.02334	0.00003700	0.99894202	Careproctus sp.
106	80540	0.01403	0.000	0.00000	0.02894	0.00003600	0.99897802	Henricia sp.
107	21313	0.01394	0.000	0.00579	0.02208	0.00003600	0.99901402	Gymnocanthus sp.
108	74000	0.01333	0.000	0.00416	0.02251	0.00003400	0.99904799	Pelecypoda unident.
109	80595	0.01302	0.000	0.00023	0.02580	0.00003300	0.99908102	Leptasterias sp.
110	50192	0.01262	0.000	0.00000	0.02942	0.00003200	0.99911302	Aphrodita negligens
111	81360	0.01236	0.000	0.00000	0.02717	0.00003200	0.99914497	Diplopteraster multipes
112	81315	0.01228	0.000	0.00000	0.03038	0.00003100	0.99917698	Pteraster tessellatus
113	20006	0.01170	0.000	0.00629	0.01710	0.00003000	0.99920601	Sarritor frenatus
114	75285	0.01106	0.000	0.00390	0.01823	0.00002800	0.99923497	Serripes groenlandicus
115	65203	0.01093	0.000	0.00000	0.02874	0.00002800	0.99926299	Balanus evermanni
116	21592	0.01090	0.000	0.00117	0.02063	0.00002800	0.99929100	Trichodon trichodon
117	81095	0.01088	0.000	0.00408	0.01768	0.00002800	0.99931902	Crossaster papposus
118	68510	0.01086	0.000	0.00181	0.01992	0.00002800	0.99934602	Oregonia gracilis
119	80160	0.01030	0.000	0.00000	0.03050	0.00002600	0.99937302	Pycnopodia helianthoides
120	21735	0.00932	0.000	0.00000	0.02022	0.00002400	0.99939698	Eleginus gracilis
121	20320	0.00862	0.000	0.00000	0.02550	0.00002200	0.99941897	Anarrhichthys ocellatus
122	81310	0.00822	0.000	0.00255	0.01390	0.00002100	0.99944001	Pteraster sp.
123	71010	0.00813	0.000	0.00306	0.01319	0.00002100	0.99946100	nudibranch unident.
124	42000	0.00808	0.000	0.00000	0.01731	0.00002100	0.99948102	Pennatulacea (order)
125	75021	0.00788	0.000	0.00000	0.01918	0.00002000	0.99950200	Saxidomus giganteus
126	20061	0.00756	0.000	0.00493	0.01020	0.00001900	0.99952102	Ocella dodecaedron
127	21438	0.00722	0.000	0.00211	0.01233	0.00001800	0.99953902	Icelus spiniger
128	68040	0.00674	0.000	0.00000	0.01432	0.00001700	0.99955702	Cancer oregonensis
129	21375	0.00658	0.000	0.00000	0.01947	0.00001700	0.99957401	Myoxocephalus sp.
130	91050	0.00638	0.000	0.00000	0.01887	0.00001600	0.99958998	Halichondria panicea
131	74980	0.00597	0.000	0.00099	0.01095	0.00001500	0.99960500	Clinocardium sp.
132	71772	0.00566	0.000	0.00000	0.01320	0.00001500	0.99962002	Beringius beringii
133	74562	0.00543	0.000	0.00057	0.01030	0.00001400	0.99963403	Musculus discors



Table C-1.--Continued.

RANK	SPECIES	MEAN CPUE (KG/HA)	VARIANCE	95 PERCENT CONFIDENCE LIMITS		PROPORTION	CUMULATIVE PROPORTION	NAME
134	95020	0.00530	0.000	0.00062	0.00998	0.00001400	0.99964702	Eucratea loricata
135	75110	0.00523	0.000	0.00000	0.01062	0.00001300	0.99966103	Mactromeris sp.
136	50000	0.00506	0.000	0.00000	0.01227	0.00001300	0.99967402	Polychaeta (class)
137	21932	0.00490	0.000	0.00053	0.00927	0.00001300	0.99968600	Hexagrammos stelleri
138	66530	0.00467	0.000	0.00014	0.00920	0.00001200	0.99969798	Crangon dalli
139	66570	0.00458	0.000	0.00000	0.00948	0.00001200	0.99971002	Argis sp.
140	43010	0.00436	0.000	0.00000	0.01266	0.00001100	0.99972099	Metridium sp.
141	22226	0.00424	0.000	0.00000	0.00898	0.00001100	0.99973202	Careproctus phasma
142	95070	0.00394	0.000	0.00000	0.00873	0.00001000	0.99974197	Rhamphostomella costata
143	30420	0.00386	0.000	0.00000	0.01144	0.00001000	0.99975199	Sebastes polyspinis
144	10212	0.00386	0.000	0.00076	0.00696	0.00001000	0.99976200	Limanda sakhalinensis
145	72063	0.00372	0.000	0.00091	0.00652	0.00001000	0.99977100	Aforia circinata
146	23807	0.00365	0.000	0.00000	0.00756	0.00000900	0.99978101	Lumpenus fabricii
147	401	0.00363	0.000	0.00122	0.00605	0.00000900	0.99979001	skate egg case unident.
148	23225	0.00331	0.000	0.00000	0.00981	0.00000800	0.99979800	Oncorhynchus kisutch
149	23240	0.00317	0.000	0.00000	0.00937	0.00000800	0.99980599	Oncorhynchus nerka
150	71710	0.00310	0.000	0.00000	0.00670	0.00000800	0.99981397	Colus sp.
151	75240	0.00307	0.000	0.00000	0.00765	0.00000800	0.99982202	Macoma sp.
152	71721	0.00291	0.000	0.00000	0.00861	0.00000700	0.99983001	Colus herendeenii
153	21350	0.00290	0.000	0.00101	0.00479	0.00000700	0.99983698	Triglops sp.
154	23808	0.00265	0.000	0.00022	0.00508	0.00000700	0.99984401	Lumpenus sagitta
155	68020	0.00261	0.000	0.00000	0.00771	0.00000700	0.99985099	Cancer magister
156	74982	0.00240	0.000	0.00000	0.00710	0.00000600	0.99985701	Clinocardium nuttallii
157	66045	0.00233	0.000	0.00109	0.00357	0.00000600	0.99986303	Pandalus gonivirus
158	74983	0.00224	0.000	0.00000	0.00527	0.00000600	0.99986798	Clinocardium ciliatum
159	22175	0.00214	0.000	0.00000	0.00511	0.00000500	0.99987400	Aptocyclus ventricosus
160	20202	0.00209	0.000	0.00050	0.00367	0.00000500	0.99987900	Ammodytes hexapterus
161	85210	0.00198	0.000	0.00000	0.00489	0.00000500	0.99988401	Psolus sp.
162	23055	0.00198	0.000	0.00000	0.00482	0.00000500	0.99988902	Osmerus mordax
163	71769	0.00195	0.000	0.00000	0.00494	0.00000500	0.99989402	Beringius sp.
164	66611	0.00193	0.000	0.00005	0.00381	0.00000500	0.99989903	Argis lar
165	74981	0.00193	0.000	0.00000	0.00570	0.00000500	0.99990398	cockle unident.
166	20050	0.00188	0.000	0.00064	0.00312	0.00000500	0.99990898	Aspidophoroides bartoni
167	30060	0.00186	0.000	0.00000	0.00443	0.00000500	0.99991399	Sebastes alutus

Table C-1.--Continued.

RANK	SPECIES	MEAN CPUE (KG/HA)	VARIANCE	95 PERCENT CONFIDENCE LIMITS		PROPORTION	CUMULATIVE PROPORTION	NAME
168	30050	0.00179	0.000	0.00000	0.00428	0.00000500	0.99991798	Sebastes aleutianus
169	75267	0.00161	0.000	0.00027	0.00294	0.00000400	0.99992299	Siliqua alta
170	71525	0.00159	0.000	0.00026	0.00292	0.00000400	0.99992698	Natica sp.
171	80660	0.00153	0.000	0.00000	0.00308	0.00000400	0.99993098	Pseudarchaster parelii
172	10180	0.00145	0.000	0.00000	0.00352	0.00000400	0.99993402	Microstomus pacificus
173	74050	0.00143	0.000	0.00000	0.00358	0.00000400	0.99993801	Mytilidae
174	74100	0.00141	0.000	0.00000	0.00314	0.00000400	0.99994200	Pectinid unident.
175	71731	0.00120	0.000	0.00000	0.00355	0.00000300	0.99994498	Colus halli
176	95080	0.00116	0.000	0.00000	0.00275	0.00000300	0.99994802	Cellepora ventricosa
177	66502	0.00111	0.000	0.00035	0.00187	0.00000300	0.99994999	Crangon sp.
178	74104	0.00102	0.000	0.00000	0.00303	0.00000300	0.99995297	Chlamys sp.
179	71774	0.00100	0.000	0.00000	0.00297	0.00000300	0.99995601	Beringius stimpsoni
180	30150	0.00096	0.000	0.00000	0.00284	0.00000200	0.99995798	Sebastes ciliatus
181	43040	0.00095	0.000	0.00000	0.00202	0.00000200	0.99996102	Tealia sp.
182	72501	0.00094	0.000	0.00000	0.00278	0.00000200	0.99996299	Fusitriton sp.
183	21921	0.00092	0.000	0.00000	0.00271	0.00000200	0.99996501	Pleurogrammus monopterygius
184	20001	0.00082	0.000	0.00000	0.00198	0.00000200	0.99996698	Pallasina barbata
185	74106	0.00079	0.000	0.00000	0.00200	0.00000200	0.99996901	Chlamys rubida
186	95030	0.00078	0.000	0.00000	0.00166	0.00000200	0.99997097	Flustra serrulata
187	75201	0.00075	0.000	0.00000	0.00179	0.00000200	0.99997300	Tellina sp.
188	72059	0.00068	0.000	0.00000	0.00200	0.00000200	0.99997503	Aforia sp.
189	66580	0.00067	0.000	0.00014	0.00119	0.00000200	0.99997699	Argis dentata
190	81060	0.00064	0.000	0.00000	0.00191	0.00000200	0.99997801	Solaster sp.
191	71764	0.00062	0.000	0.00000	0.00184	0.00000200	0.99997997	Volutopsius middendorffii
192	23805	0.00059	0.000	0.00000	0.00166	0.00000200	0.99998099	Lumpenus maculatus
193	81064	0.00054	0.000	0.00000	0.00160	0.00000100	0.99998301	Solaster dawsoni
194	72790	0.00054	0.000	0.00000	0.00160	0.00000100	0.99998403	Arctomelon stearnsii
195	21300	0.00051	0.000	0.00000	0.00141	0.00000100	0.99998599	Cottidae
196	65000	0.00049	0.000	0.00000	0.00145	0.00000100	0.99998701	Cirripedia (class)
197	22178	0.00047	0.000	0.00000	0.00100	0.00000100	0.99998802	Eumicrotremus orbis
198	75205	0.00045	0.000	0.00000	0.00117	0.00000100	0.99998897	Tellina lutea
199	75284	0.00042	0.000	0.00000	0.00101	0.00000100	0.99998999	Serripes sp.
200	20002	0.00030	0.000	0.00000	0.00090	0.00000100	0.99999100	Percis japonicus
201	74650	0.00028	0.000	0.00000	0.00083	0.00000100	0.99999201	Cardita sp.

Table C-1.--Continued.

RANK	SPECIES	MEAN CPUE (KG/HA)	VARIANCE	95 PERCENT CONFIDENCE LIMITS		PROPORTION	CUMULATIVE PROPORTION	NAME
202	21333	0.00026	0.000	0.00000	0.00076	0.00000100	0.99999201	Arteidiellus pacificus
203	54010	0.00025	0.000	0.00000	0.00074	0.00000100	0.99999303	Nereis sp.
204	80729	0.00024	0.000	0.00000	0.00052	0.00000100	0.99999398	Ceramaster japonicus
205	75286	0.00023	0.000	0.00000	0.00050	0.00000100	0.99999398	Serripes laperousii
206	74080	0.00023	0.000	0.00000	0.00068	0.00000100	0.99999499	Mytilus edulis
207	74416	0.00023	0.000	0.00000	0.00068	0.00000100	0.99999499	Yoldia scissurata
208	66170	0.00021	0.000	0.00000	0.00041	0.00000100	0.99999601	Eualus sp.
209	94000	0.00021	0.000	0.00000	0.00050	0.00000100	0.99999702	Sipuncula (phylum)
210	74655	0.00020	0.000	0.00000	0.00060	0.00000100	0.99999702	Cyclocardia crebricostata
211	75264	0.00018	0.000	0.00000	0.00052	0.00000000	0.99999702	Siliqua sp.
212	21339	0.00017	0.000	0.00000	0.00052	0.00000000	0.99999797	Malacocottus sp.
213	80000	0.00017	0.000	0.00000	0.00041	0.00000000	0.99999797	starfish unident.
214	79000	0.00015	0.000	0.00000	0.00037	0.00000000	0.99999899	squid unident.
215	74435	0.00010	0.000	0.00000	0.00025	0.00000000	0.99999899	Nuculana sp.
216	66150	0.00010	0.000	0.00000	0.00030	0.00000000	0.99999899	Hippolytidae (family)
217	71770	0.00010	0.000	0.00000	0.00029	0.00000000	1.00000000	Beringius kennicottii
218	80010	0.00008	0.000	0.00000	0.00023	0.00000000	1.00000000	Evasterias sp.
219	66203	0.00005	0.000	0.00000	0.00016	0.00000000	1.00000000	Lebbeus groenlandicus
220	75600	0.00005	0.000	0.00000	0.00016	0.00000000	1.00000000	Pododesmus macroschisma

## APPENDIX D

## Abundance Estimates for Principal Fish Species

Appendix D presents estimates of catch-per-unit-effort (CPUE), population numbers and biomass for the principal fish species. Estimates of variance and confidence intervals do not incorporate variation associated with fishing power corrections or measurements of effort. CPUE is measured in kilograms (kg) and numbers (no.) per hectare. Estimates are given separately for each of the 10 geographic strata used in the analysis; estimates for each of the six standard subareas are presented as subtotals of the component strata. Stratum codes correspond to subareas as follows:

<u>Subarea</u>	<u>Stratum</u>
1	10
2	20
3	31
	32 (Pribilof Islands high density)
4	41
	42 (Pribilof Islands high density)
	43 (St. Matthew Island high density)
5	50
6	61
	62 (St. Matthew Island high density)

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Table D-1.--CPUE, population, and biomass estimates for walleye pollock.

CPUE								
Stratum	Total hauls	Hauls with catch	Hauls with nums.	Hauls with L-F	Mean CPUE (kg/ha)	Variance mean CPUE (kg/ha)	Mean CPUE (no/ha)	Variance mean CPUE (no/ha)
10	58	57	57	56	49.64	.20160E+03	44.83	.16750E+03
20	31	31	31	30	28.62	.40680E+02	32.67	.76810E+02
31	69	69	69	69	165.93	.95370E+03	251.84	.24490E+04
32	8	8	8	8	204.91	.14310E+04	369.60	.68030E+04
Subtotal	77	77	77	77	169.24	.80890E+03	261.84	.21000E+04
41	44	44	44	43	38.29	.15320E+03	94.73	.76120E+03
42	31	30	30	29	136.74	.92700E+03	174.25	.15820E+04
43	21	21	21	21	13.36	.67440E+01	25.26	.89810E+01
Subtotal	96	95	95	93	55.34	.98030E+02	98.84	.33630E+03
50	26	25	25	25	135.36	.35730E+04	187.85	.81530E+04
61	60	58	58	58	176.64	.14580E+04	361.32	.70260E+04
62	7	7	7	7	71.88	.17150E+03	164.14	.66910E+04
Subtotal	67	65	65	65	169.52	.12670E+04	347.92	.61340E+04
Total	355	350	350	346	106.14	.12210E+03	173.97	.40610E+03

POPULATION					
Stratum	Population	Variance population	Eff. deg. freedom	95% Confidence Limits	
				Lower	Upper
10	349,100,355	.10158E+17	57.00	145,405,341	552,795,370
20	134,037,431	.12928E+16	30.00	60,508,206	207,566,656
31	2,380,515,880	.21886E+18	68.00	1,444,869,562	3,316,162,199
32	324,290,766	.52374E+16	7.00	147,201,239	501,380,293
Subtotal	2,704,806,646	.22410E+18	70.90	1,758,031,206	3,651,582,086
41	593,988,936	.29928E+17	43.00	244,360,764	943,617,108
42	418,395,378	.91233E+16	30.00	223,352,057	613,438,699
43	53,320,339	.40015E+14	20.00	40,124,763	66,515,916
Subtotal	1,065,704,653	.39091E+17	64.73	670,273,433	1,461,135,873
50	728,699,262	.12269E+18	25.00	7,150,087	1,450,248,436
61	3,184,479,429	.54572E+18	59.00	1,691,512,910	4,677,445,948
62	105,518,571	.27653E+16	6.00	0	234,195,773
Subtotal	3,289,998,000	.54848E+18	59.58	1,793,253,683	4,786,742,317
Total	8,272,346,348	.94581E+18	140.10	6,346,744,032	10,197,948,664

Table D-1.--Continued.

BIOMASS					
Stratum	Biomass (t)	Variance biomass	Eff. deg. freedom	95% Confidence Limits	
				Lower	Upper
10	386,584	.12222E+11	57.00	163,157	610,011
20	117,436	.68468E+09	30.00	63,926	170,946
31	1,568,439	.85215E+11	68.00	984,606	2,152,272
32	179,793	.11018E+10	7.00	101,290	258,296
Subtotal	1,748,232	.86317E+11	69.66	1,160,636	2,335,827
41	240,116	.60220E+10	43.00	83,283	396,948
42	328,326	.53443E+10	30.00	179,046	477,607
43	28,208	.30046E+08	20.00	16,774	39,642
Subtotal	596,650	.11396E+11	72.34	383,142	810,157
50	525,084	.53776E+11	25.00	47,379	1,002,789
61	1,556,827	.11324E+12	59.00	876,749	2,236,905
62	46,208	.70894E+08	6.00	25,604	66,811
Subtotal	1,603,034	.11331E+12	59.07	922,744	2,283,325
Total	4,977,019	.27770E+12	173.53	3,933,609	6,020,430

Table D-2.--CPUE, population, and biomass estimates for Pacific cod.

CPUE								
Stratum	Total hauls	Hauls with catch	Hauls with nums.	Hauls with L-F	Mean CPUE (kg/ha)	Variance mean CPUE (kg/ha)	Mean CPUE (no/ha)	Variance mean CPUE (no/ha)
10	58	56	56	56	40.23	.93880E+02	57.47	.19280E+03
20	31	29	29	29	12.14	.38770E+01	8.31	.15670E+01
31	69	68	68	67	24.13	.73890E+01	21.27	.82590E+01
32	8	8	8	8	35.26	.16010E+03	13.49	.17710E+02
Subtotal	77	76	76	75	25.08	.73420E+01	20.61	.70440E+01
41	44	40	40	40	10.33	.68480E+01	11.60	.75700E+01
42	31	31	31	31	57.91	.96660E+02	78.49	.37110E+03
43	21	21	21	21	17.26	.23990E+02	33.70	.96530E+02
Subtotal	96	92	92	92	22.28	.80290E+01	30.82	.24660E+02
50	26	26	26	26	13.43	.59510E+01	5.22	.12250E+01
61	60	60	60	60	49.50	.70730E+03	20.09	.10410E+03
62	7	7	7	7	27.00	.43060E+02	21.24	.18480E+02
Subtotal	67	67	67	67	47.97	.61460E+03	20.16	.90510E+02
Total	355	346	346	345	30.36	.24450E+02	29.03	.12930E+02

POPULATION					
Stratum	Population	Variance population	Eff. deg. freedom	95% Confidence Limits	
				Lower	Upper
10	447,556,393	.11689E+17	57.00	229,059,081	666,053,705
20	34,099,201	.26376E+14	30.00	23,611,900	44,586,503
31	201,057,625	.73798E+15	68.00	146,725,914	255,389,336
32	11,836,240	.13632E+14	7.00	3,104,421	20,568,058
Subtotal	212,893,865	.75162E+15	70.30	158,062,658	267,725,072
41	72,707,869	.29762E+15	43.00	37,842,039	107,573,698
42	188,452,039	.21396E+16	30.00	93,998,246	282,905,833
43	71,130,135	.43007E+15	20.00	27,870,214	114,390,056
Subtotal	332,290,043	.28673E+16	50.17	224,071,742	440,508,345
50	20,233,957	.18431E+14	25.00	11,390,077	29,077,838
61	177,032,308	.80859E+16	59.00	0	358,764,420
62	13,652,513	.76387E+13	6.00	6,546,732	20,758,294
Subtotal	190,684,821	.80936E+16	59.11	8,866,889	372,502,753
Total	1,237,758,281	.23446E+17	149.49	934,580,270	1,540,936,293



Table D-2.--Continued.

BIOMASS					
Stratum	Biomass (t)	Variance biomass	Eff. deg. freedom	95% Confidence Limits Lower	Upper
10	313,296	.56928E+10	57.00	160,810	465,783
20	49,787	.65255E+08	30.00	33,267	66,306
31	228,108	.66018E+09	68.00	176,720	279,496
32	30,940	.12325E+09	7.00	4,684	57,195
Subtotal	259,047	.78343E+09	71.54	203,068	315,027
41	64,794	.26925E+09	43.00	31,632	97,956
42	139,053	.55729E+09	30.00	90,848	187,259
43	36,423	.10690E+09	20.00	14,783	58,063
Subtotal	240,270	.93344E+09	69.11	179,166	301,375
50	52,095	.89549E+08	25.00	32,601	71,589
61	436,268	.54940E+11	59.00	0	909,976
62	17,356	.17796E+08	6.00	7,033	27,679
Subtotal	453,625	.54958E+11	59.04	0	927,408
Total	1,368,120	.62522E+11	75.54	868,032	1,868,209

Table D-3.--CPUE, population, and biomass estimates for yellowfin sole.

CPUE								
Stratum	Total hauls	Hauls with catch	Hauls with nums.	Hauls with L-F	Mean CPUE (kg/ha)	Variance mean CPUE (kg/ha)	Mean CPUE (no/ha)	Variance mean CPUE (no/ha)
10	58	58	58	58	159.94	.28470E+03	678.74	.53180E+04
20	31	31	31	31	113.51	.25180E+03	555.76	.89150E+04
31	69	65	65	65	72.66	.79640E+02	265.60	.12740E+04
32	8	7	7	7	5.15	.87090E+01	13.28	.70540E+02
Subtotal	77	72	72	72	66.93	.66750E+02	244.17	.10670E+04
41	44	42	42	42	12.22	.51510E+01	39.29	.56600E+02
42	31	28	28	28	52.19	.22320E+03	144.07	.18030E+04
43	21	21	21	21	2.44	.18980E+01	8.70	.25780E+02
Subtotal	96	91	91	91	19.20	.12880E+02	56.64	.10960E+03
50	26	1	1	1	0.14	.18680E-01	0.22	.48880E-01
61	60	2	2	2	0.04	.99770E-03	0.06	.34100E-02
62	7	2	2	2	0.03	.36130E-03	0.09	.39670E-02
Subtotal	67	4	4	4	0.04	.86830E-03	0.07	.29800E-02
Total	355	257	257	257	56.51	.23650E+02	229.34	.45240E+03

POPULATION					
Stratum	Population	Variance population	Eff. deg. freedom	95% Confidence Limits	
				Lower	Upper
10	5,285,437,480	.32247E+18	57.00	4,137,788,647	6,433,086,314
20	2,280,121,278	.15005E+18	30.00	1,489,120,742	3,071,121,815
31	2,510,584,896	.11380E+18	68.00	1,835,906,266	3,185,263,526
32	11,648,639	.54310E+14	7.00	0	29,077,523
Subtotal	2,522,233,535	.11385E+18	68.06	1,847,393,930	3,197,073,141
41	246,383,580	.22253E+16	43.00	151,047,472	341,719,687
42	345,934,558	.10398E+17	30.00	137,713,476	554,155,640
43	18,363,295	.11485E+15	20.00	0	40,718,684
Subtotal	610,681,433	.12738E+17	43.63	382,587,304	838,775,561
50	857,691	.73563E+12	25.00	0	2,627,966
61	571,521	.26485E+12	59.00	0	1,611,591
62	58,394	.16397E+10	6.00	0	157,479
Subtotal	629,915	.26648E+12	59.71	0	1,673,199
Total	10,699,961,333	.59911E+18	129.62	9,167,397,640	12,232,525,026

Table D-3.--Continued.

BIOMASS					
Stratum	Biomass (t)	Variance biomass	Eff. deg. freedom	95% Confidence Limits	
				Lower	Upper
10	1,245,478	.17265E+11	57.00	979,923	1,511,032
20	465,687	.42382E+10	30.00	332,749	598,624
31	686,857	.71162E+10	68.00	518,142	855,572
32	4,521	.67046E+07	7.00	0	10,645
Subtotal	691,378	.71229E+10	68.13	522,583	860,172
41	76,607	.20253E+09	43.00	47,845	105,368
42	125,307	.12867E+10	30.00	52,058	198,556
43	5,153	.84571E+07	20.00	0	11,219
Subtotal	207,066	.14977E+10	39.96	128,040	286,092
50	530	.28116E+06	25.00	0	1,623
61	318	.77494E+05	59.00	0	881
62	18	.14931E+03	6.00	0	48
Subtotal	336	.77644E+05	59.23	0	899
Total	2,610,474	.30125E+11	136.89	2,266,817	2,954,131

Table D-4.--CPUE, population, and biomass estimates for rock sole.

CPUE								
Stratum	Total hauls	Hauls with catch	Hauls with nums.	Hauls with L-F	Mean CPUE (kg/ha)	Variance mean CPUE (kg/ha)	Mean CPUE (no/ha)	Variance mean CPUE (no/ha)
10	58	58	58	56	211.24	.42250E+03	1199.46	.11180E+05
20	31	30	30	30	48.16	.50140E+02	286.60	.18450E+04
31	69	67	67	67	49.77	.62290E+02	280.78	.21690E+04
32	8	8	8	8	35.05	.28380E+03	159.77	.83270E+04
Subtotal	77	75	75	75	48.52	.54200E+02	270.51	.18760E+04
41	44	34	34	33	7.59	.24250E+01	29.86	.34990E+02
42	31	30	30	30	167.32	.37500E+04	742.38	.12820E+06
43	21	20	20	20	11.93	.20920E+02	38.91	.30170E+03
Subtotal	96	84	84	83	44.01	.18760E+03	190.30	.63810E+04
50	26	14	14	14	1.05	.18140E+00	2.81	.16480E+01
61	60	54	54	52	7.81	.21950E+01	16.41	.96220E+01
62	7	7	7	7	4.76	.47440E+01	10.52	.16400E+02
Subtotal	67	61	61	59	7.60	.19290E+01	16.01	.84340E+01
Total	355	322	322	317	66.93	.58790E+02	353.19	.18560E+04

POPULATION					
Stratum	Population	Variance population	Eff. deg. freedom	95% Confidence Limits	
				Lower	Upper
10	9,340,369,787	.67806E+18	57.00	7,676,192,221	11,004,547,354
20	1,175,840,883	.31050E+17	30.00	816,021,304	1,535,660,462
31	2,654,147,524	.19379E+18	68.00	1,773,726,572	3,534,568,476
32	140,187,407	.64104E+16	7.00	0	329,540,505
Subtotal	2,794,334,931	.20020E+18	71.81	1,899,470,416	3,689,199,446
41	187,257,055	.13759E+16	43.00	112,292,376	262,221,734
42	1,782,525,253	.73906E+18	30.00	27,051,099	3,537,999,407
43	82,124,633	.13442E+16	20.00	5,644,165	158,605,101
Subtotal	2,051,906,941	.74178E+18	30.22	293,205,230	3,810,608,652
50	10,918,503	.24803E+14	25.00	659,066	21,177,940
61	144,642,637	.74740E+15	59.00	89,391,198	199,894,077
62	6,760,841	.67788E+13	6.00	66,961	13,454,722
Subtotal	151,403,479	.75418E+15	60.03	96,478,755	206,328,203
Total	15,524,774,524	.16519E+19	101.60	12,954,281,701	18,095,267,346

Table D-4.--Continued.

BIOMASS					
Stratum	Biomass (t)	Variance biomass	Eff. deg. freedom	95% Confidence Limits	
				Lower	Upper
10	1,644,930	.25621E+11	57.00	1,321,437	1,968,423
20	197,585	.84394E+09	30.00	138,176	256,993
31	470,435	.55655E+10	68.00	321,231	619,639
32	30,751	.21845E+09	7.00	0	66,918
Subtotal	501,186	.57839E+10	72.36	349,082	653,290
41	47,591	.95344E+08	43.00	27,857	67,325
42	401,758	.21621E+11	30.00	101,059	702,458
43	25,175	.93212E+08	20.00	5,036	45,315
Subtotal	474,525	.21810E+11	30.52	172,960	776,089
50	4,082	.27305E+07	25.00	671	7,492
61	68,826	.17050E+09	59.00	42,437	95,215
62	3,060	.19605E+07	6.00	0	6,660
Subtotal	71,886	.17246E+09	60.29	45,622	98,151
Total	2,894,194	.54234E+11	106.64	2,428,431	3,359,957

Table D-5.--CPUE, population, and biomass estimates for *Hippoglossoides* spp.

CPUE								
Stratum	Total hauls	Hauls with catch	Hauls with nums.	Hauls with L-F	Mean CPUE (kg/ha)	Variance mean CPUE (kg/ha)	Mean CPUE (no/ha)	Variance mean CPUE (no/ha)
10	58	41	41	39	5.09	.79580E+00	10.73	.46630E+01
20	31	10	10	10	0.12	.13170E-02	0.24	.60150E-02
31	69	69	69	68	34.75	.19720E+02	96.52	.17450E+03
32	8	8	8	8	12.54	.66110E+02	32.19	.40050E+03
Subtotal	77	77	77	76	32.87	.16990E+02	91.06	.14900E+03
41	44	43	43	43	4.50	.20940E+01	16.62	.32290E+02
42	31	27	27	27	10.76	.57230E+01	22.14	.20040E+02
43	21	20	20	20	6.16	.21240E+01	23.05	.26020E+02
Subtotal	96	90	90	90	6.22	.10730E+01	19.11	.12910E+02
50	26	26	26	26	26.50	.11050E+02	154.48	.48370E+03
61	60	60	60	60	19.80	.60180E+01	83.86	.89700E+02
62	7	7	7	7	3.44	.20690E+01	22.73	.16100E+03
Subtotal	67	67	67	67	18.69	.52370E+01	79.71	.78660E+02
Total	355	311	311	308	15.10	.15110E+01	52.55	.18680E+02

POPULATION					
Stratum	Population	Variance population	Eff. deg. freedom	95% Confidence Limits	
				Lower	Upper
10	83,548,032	.28277E+15	57.00	49,563,348	117,532,715
20	980,182	.10125E+12	30.00	330,434	1,629,931
31	912,361,941	.15593E+17	68.00	662,616,672	1,162,107,209
32	28,247,877	.30831E+15	7.00	0	71,214,257
Subtotal	940,609,818	.15901E+17	70.45	688,407,627	1,192,812,008
41	104,208,757	.12694E+16	43.00	32,204,374	176,213,140
42	53,166,547	.11551E+15	30.00	31,187,416	75,145,677
43	48,660,610	.11593E+15	20.00	26,125,383	71,195,837
Subtotal	206,035,914	.15008E+16	58.36	127,741,987	284,329,841
50	599,250,966	.72795E+16	25.00	423,492,103	775,009,829
61	739,133,284	.69676E+16	59.00	570,436,545	907,830,023
62	14,609,205	.66552E+14	6.00	0	34,571,725
Subtotal	753,742,489	.70341E+16	60.08	586,003,254	921,481,725
Total	2,584,167,401	.31999E+17	155.79	2,229,981,165	2,938,353,637

Table D-5.--Continued.

BIOMASS					
Stratum	Biomass (t)	Variance biomass	Eff. deg. freedom	95% Confidence Limits	
				Lower	Upper
10	39,675	.48259E+08	57.00	25,635	53,715
20	481	.22169E+05	30.00	177	785
31	328,496	.17619E+10	68.00	244,546	412,445
32	11,004	.50895E+08	7.00	0	27,876
Subtotal	339,499	.18128E+10	71.41	254,346	424,653
41	28,208	.82340E+08	43.00	9,870	46,547
42	25,838	.32993E+08	30.00	14,091	37,584
43	13,011	.94619E+07	20.00	6,595	19,428
Subtotal	67,057	.12480E+09	78.47	44,715	89,400
50	102,782	.16634E+09	25.00	76,162	129,402
61	174,503	.46743E+09	59.00	130,808	218,197
62	2,214	.85487E+06	6.00	0	4,591
Subtotal	176,717	.46828E+09	59.21	132,982	220,451
Total	726,212	.26205E+10	134.46	624,855	827,569

Table D-6.--CPUE, population, and biomass estimates for Alaska plaice.

CPUE								
Stratum	Total hauls	Hauls with catch	Hauls with nums.	Hauls with L-F	Mean CPUE (kg/ha)	Variance mean CPUE (kg/ha)	Mean CPUE (no/ha)	Variance mean CPUE (no/ha)
10	58	49	49	48	19.06	.13420E+02	38.50	.43810E+02
20	31	31	31	31	18.23	.12260E+02	48.52	.10520E+03
31	69	57	57	54	14.02	.55060E+01	19.18	.10850E+02
32	8	6	6	6	2.97	.17370E+01	2.05	.70320E+00
Subtotal	77	63	63	60	13.08	.46230E+01	17.73	.90900E+01
41	44	40	40	40	27.49	.22790E+02	36.26	.43820E+02
42	31	27	27	26	18.29	.38750E+02	23.19	.65930E+02
43	21	20	20	20	14.92	.34420E+02	16.18	.48320E+02
Subtotal	96	87	87	86	22.98	.10950E+02	29.42	.19940E+02
50	26	1	1	1	0.01	.82300E-04	0.01	.69390E-04
61	60	11	11	10	1.71	.66670E+00	1.23	.31240E+00
62	7	6	6	6	2.84	.49890E+01	1.44	.12290E+01
Subtotal	67	17	17	16	1.78	.60220E+00	1.24	.27700E+00
Total	355	248	248	242	13.73	.16270E+01	22.02	.43910E+01

POPULATION					
Stratum	Population	Variance population	Eff. deg. freedom	95% Confidence Limits	
				Lower	Upper
10	299,837,409	.26566E+16	57.00	195,670,319	404,004,499
20	199,056,850	.17713E+16	30.00	112,989,274	285,124,427
31	181,344,134	.96943E+15	68.00	119,072,868	243,615,400
32	1,802,302	.54137E+12	7.00	62,189	3,542,416
Subtotal	183,146,437	.96997E+15	68.08	120,857,785	245,435,088
41	227,354,948	.17228E+16	43.00	143,469,490	311,240,406
42	55,679,832	.38011E+15	30.00	15,809,676	95,549,988
43	34,152,483	.21526E+15	20.00	3,547,186	64,757,780
Subtotal	317,187,263	.23182E+16	70.55	220,892,011	413,482,514
50	32,315	.10443E+10	25.00	0	98,885
61	10,817,878	.24266E+14	59.00	862,352	20,773,403
62	926,931	.50771E+12	6.00	0	2,670,504
Subtotal	11,744,808	.24774E+14	61.23	1,790,197	21,699,419
Total	1,011,005,082	.77409E+16	188.19	836,800,489	1,185,209,675



Table D-6.--Continued.

BIOMASS					
Stratum	Biomass (t)	Variance biomass	Eff. deg. freedom	95% Confidence Limits Lower	Upper
10	148,420	.81373E+09	57.00	90,769	206,071
20	74,813	.20634E+09	30.00	45,437	104,188
31	132,544	.49196E+09	68.00	88,184	176,904
32	2,610	.13375E+07	7.00	0	5,440
Subtotal	135,154	.49330E+09	68.37	90,733	179,574
41	172,391	.89612E+09	43.00	111,891	232,890
42	43,915	.22341E+09	30.00	13,394	74,437
43	31,486	.15335E+09	20.00	5,567	57,404
Subtotal	247,791	.12729E+10	75.30	176,436	319,146
50	35	.12384E+04	25.00	0	108
61	15,042	.51789E+08	59.00	498	29,586
62	1,824	.20617E+07	6.00	0	5,337
Subtotal	16,866	.53851E+08	62.81	2,189	31,543
Total	623,079	.28401E+10	211.38	517,560	728,599

Table D-7.--CPUE, population, and biomass estimates for Greenland turbot.

CPUE								
Stratum	Total hauls	Hauls with catch	Hauls with nums.	Hauls with L-F	Mean CPUE (kg/ha)	Variance mean CPUE (kg/ha)	Mean CPUE (no/ha)	Variance mean CPUE (no/ha)
10	58	0	0	0	0.00	.00000E+00	0.00	.00000E+00
20	31	0	0	0	0.00	.00000E+00	0.00	.00000E+00
31	69	3	3	3	0.22	.21030E-01	0.04	.54550E-03
32	8	0	0	0	0.00	.00000E+00	0.00	.00000E+00
Subtotal	77	3	3	3	0.21	.17610E-01	0.04	.45680E-03
41	44	6	6	6	0.29	.24640E-01	0.11	.29170E-02
42	31	1	1	0	0.01	.49750E-04	0.02	.44960E-03
43	21	5	5	5	0.12	.44640E-02	0.08	.18420E-02
Subtotal	96	12	12	11	0.19	.85080E-02	0.09	.10790E-02
50	26	1	1	1	0.06	.31040E-02	0.01	.65280E-04
61	60	24	24	24	4.76	.15560E+01	1.90	.20480E+00
62	7	7	7	7	3.70	.26750E+01	1.58	.25700E+00
Subtotal	67	31	31	31	4.69	.13640E+01	1.88	.17910E+00
Total	355	47	47	46	0.97	.54900E-01	0.38	.73930E-02

POPULATION						
Stratum	Population	Variance population	Eff. deg. freedom	95% Confidence Limits		
				Lower	Upper	
10	0	.00000E+00	57.00	0	0	
20	0	.00000E+00	30.00	0	0	
31	369,816	.48740E+11	68.00	0	811,358	
32	0	.00000E+00	7.00	0	0	
Subtotal	369,816	.48740E+11	15.48	0	840,279	
41	715,212	.11467E+12	43.00	30,834	1,399,590	
42	50,910	.25918E+10	30.00	0	155,020	
43	170,975	.82088E+10	20.00	0	359,972	
Subtotal	937,097	.12547E+12	50.88	221,215	1,652,980	
50	31,343	.98238E+09	25.00	0	95,909	
61	16,782,069	.15907E+14	59.00	8,721,703	24,842,435	
62	1,013,583	.10623E+12	6.00	216,031	1,811,135	
Subtotal	17,795,652	.16013E+14	59.76	9,708,415	25,882,888	
Total	19,133,908	.16188E+14	73.92	11,087,043	27,180,773	

Table D-7.--Continued.

BIOMASS					
Stratum	Biomass (t)	Variance biomass	Eff. deg. freedom	95% Confidence Limits	
				Lower	Upper
10	0	.00000E+00	57.00	0	0
20	0	.00000E+00	30.00	0	0
31	2,124	.18790E+07	68.00	0	4,865
32	0	.00000E+00	7.00	0	0
Subtotal	2,124	.18790E+07	73.28	0	4,865
41	1,814	.96891E+06	43.00	0	3,804
42	17	.28683E+03	30.00	0	52
43	251	.19891E+05	20.00	0	546
Subtotal	2,083	.98909E+06	44.77	73	4,093
50	216	.46703E+05	25.00	0	661
61	41,970	.12085E+09	59.00	19,753	64,187
62	2,378	.11054E+07	6.00	0	4,950
Subtotal	44,347	.12195E+09	60.03	22,261	66,434
Total	48,770	.12487E+09	64.62	26,421	71,119

Table D-8.--CPUE, population, and biomass estimates for *Atheresthes* spp.

CPUE								
Stratum	Total hauls	Hauls with catch	Hauls with nums.	Hauls with L-F	Mean CPUE (kg/ha)	Variance mean CPUE (kg/ha)	Mean CPUE (no/ha)	Variance mean CPUE (no/ha)
10	58	4	4	4	0.78	.25410E+00	1.13	.61630E+00
20	31	0	0	0	0.00	.00000E+00	0.00	.00000E+00
31	69	47	47	47	15.32	.86470E+01	26.25	.26920E+02
32	8	8	8	8	20.08	.14300E+02	40.98	.19530E+03
Subtotal	77	55	55	55	15.72	.73440E+01	27.50	.23950E+02
41	44	5	5	5	0.21	.25180E-01	0.39	.72650E-01
42	31	14	14	14	8.51	.91850E+01	27.98	.27900E+03
43	21	1	1	1	0.06	.33930E-02	0.04	.16620E-02
Subtotal	96	20	20	20	2.03	.46410E+00	6.47	.13860E+02
50	26	26	26	26	44.57	.24640E+02	72.67	.75010E+02
61	60	55	55	54	23.38	.19090E+02	27.65	.28810E+02
62	7	5	5	5	2.07	.71640E+00	1.43	.44640E+00
Subtotal	67	60	60	59	21.93	.16590E+02	25.87	.25030E+02
Total	355	165	165	164	11.59	.15350E+01	18.73	.55200E+01

## POPULATION

Stratum	Population	Variance population	Eff. deg. freedom	95% Confidence Limits	
				Lower	Upper
10	8,783,366	.37371E+14	57.00	0	21,138,074
20	0	.00000E+00	30.00	0	0
31	248,142,180	.24055E+16	68.00	150,050,758	346,233,603
32	35,960,825	.15039E+15	7.00	6,958,068	64,963,581
Subtotal	284,103,005	.25559E+16	73.96	182,991,762	385,214,248
41	2,469,775	.28564E+13	43.00	0	5,885,465
42	67,186,844	.16084E+16	30.00	0	149,202,302
43	86,059	.74062E+10	20.00	0	265,578
Subtotal	69,742,678	.16113E+16	30.11	0	151,710,695
50	281,920,094	.11288E+16	25.00	212,710,249	351,129,940
61	243,718,898	.22377E+16	59.00	148,117,311	339,320,485
62	917,144	.18450E+12	6.00	0	1,968,213
Subtotal	244,636,042	.22379E+16	59.01	149,030,514	340,241,571
Total	889,185,185	.75712E+16	184.70	716,900,529	1,061,469,842

Table D-8.--Continued.

BIOMASS					
Stratum	Biomass (t)	Variance biomass	Eff. deg. freedom	95% Confidence Limits	
				Lower	Upper
10	6,082	.15406E+08	57.00	0	14,015
20	0	.00000E+00	30.00	0	0
31	144,780	.77265E+09	68.00	89,186	200,373
32	17,622	.11008E+08	7.00	9,775	25,469
Subtotal	162,402	.78366E+09	69.81	106,414	218,389
41	1,287	.99012E+06	43.00	0	3,298
42	20,431	.52953E+08	30.00	5,550	35,312
43	123	.15118E+05	20.00	0	380
Subtotal	21,841	.53958E+08	31.14	6,841	36,841
50	172,906	.37083E+09	25.00	133,160	212,652
61	206,043	.14829E+10	59.00	128,218	283,868
62	1,331	.29607E+06	6.00	0	2,662
Subtotal	207,374	.14832E+10	59.02	129,541	285,207
Total	570,605	.27070E+10	141.89	467,587	673,622

Table D-9.--CPUE, population, and biomass estimates for Pacific halibut.

CPUE								
Stratum	Total hauls	Hauls with catch	Hauls with nums.	Hauls with L-F	Mean CPUE (kg/ha)	Variance mean CPUE (kg/ha)	Mean CPUE (no/ha)	Variance mean CPUE (no/ha)
10	58	58	58	58	5.57	.54760E+00	1.98	.84960E-01
20	31	26	26	26	2.49	.23840E+00	0.99	.38400E-01
31	69	58	58	58	3.98	.36770E+00	1.14	.26770E-01
32	8	7	7	7	3.37	.21730E+01	0.95	.20710E+00
Subtotal	77	65	65	65	3.93	.32350E+00	1.13	.23910E-01
41	44	23	23	23	0.72	.23710E-01	0.36	.56950E-02
42	31	29	29	29	4.34	.62660E+00	2.51	.11040E+01
43	21	15	15	15	2.43	.10740E+01	0.41	.91620E-02
Subtotal	96	67	67	67	1.86	.80250E-01	0.85	.57010E-01
50	26	23	23	23	3.88	.53400E+00	0.64	.17580E-01
61	60	44	44	44	3.55	.42430E+00	0.74	.21470E-01
62	7	6	6	6	4.13	.47390E+01	0.34	.84720E-02
Subtotal	67	50	50	50	3.59	.39050E+00	0.72	.18690E-01
Total	355	289	289	289	3.56	.61230E-01	1.12	.13850E-01

POPULATION					
Stratum	Population	Variance population	Eff. deg. freedom	95% Confidence Limits	
				Lower	Upper
10	15,419,558	.51518E+13	57.00	10,832,397	20,006,719
20	4,068,473	.64635E+12	30.00	2,426,789	5,710,157
31	10,789,939	.23919E+13	68.00	7,696,797	13,883,081
32	833,463	.15943E+12	7.00	0	1,777,789
Subtotal	11,623,402	.25513E+13	74.17	8,428,834	14,817,970
41	2,275,339	.22390E+12	43.00	1,319,033	3,231,645
42	6,015,730	.63626E+13	30.00	864,932	11,166,528
43	869,756	.40822E+11	20.00	446,879	1,292,633
Subtotal	9,160,825	.66274E+13	32.52	3,903,967	14,417,684
50	2,475,416	.26451E+12	25.00	1,415,943	3,534,888
61	6,552,022	.16680E+13	59.00	3,941,853	9,162,192
62	221,592	.35012E+10	6.00	76,800	366,383
Subtotal	6,773,614	.16715E+13	59.25	4,160,706	9,386,521
Total	49,521,288	.16913E+14	145.40	41,378,494	57,664,081

Table D-9.--Continued.

BIOMASS					
Stratum	Biomass (t)	Variance biomass	Eff. deg. freedom	95% Confidence Limits	
				Lower	Upper
10	43,400	.33208E+08	57.00	31,754	55,047
20	10,214	.40125E+07	30.00	6,118	14,311
31	37,659	.32851E+08	68.00	26,196	49,122
32	2,958	.16726E+07	7.00	0	6,017
Subtotal	40,617	.34523E+08	73.26	28,866	52,369
41	4,525	.93218E+06	43.00	2,574	6,476
42	10,430	.36127E+07	30.00	6,549	14,311
43	5,132	.47847E+07	20.00	569	9,695
Subtotal	20,087	.93296E+07	54.40	13,914	26,260
50	15,055	.80359E+07	25.00	9,215	20,895
61	31,304	.32959E+08	59.00	19,702	42,906
62	2,652	.19585E+07	6.00	0	6,250
Subtotal	33,956	.34917E+08	64.00	22,138	45,774
Total	163,330	.12403E+09	259.01	141,280	185,381

## APPENDIX E

Population Estimates by Sex and Size  
Groups for Principal Fish Species

Appendix E presents estimates of the numbers of individuals within the overall survey area by sex and size group for principal fish species.

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Table E-1.--Population estimates by sex and size group for walleye pollock from the 1994 eastern Bering Sea bottom trawl survey.

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative Proportion
50	294,843	0	0	294,843	0.0000	0.0000
60	0	67,634	0	67,634	0.0000	0.0000
70	0	246,359	0	246,359	0.0000	0.0001
80	0	0	1,252,690	1,252,690	0.0002	0.0002
90	0	0	10,460,465	10,460,465	0.0013	0.0015
100	0	118,832	76,429,200	76,548,032	0.0093	0.0107
110	412,416	526,613	181,412,510	182,351,539	0.0220	0.0328
120	2,634,785	2,808,177	221,879,641	227,322,603	0.0275	0.0603
130	5,687,831	2,518,732	158,058,139	166,264,702	0.0201	0.0804
140	7,780,019	6,591,215	157,432,228	171,803,462	0.0208	0.1011
150	9,314,129	8,018,042	147,480,938	164,813,109	0.0199	0.1211
160	9,520,522	5,855,472	75,227,969	90,603,962	0.0110	0.1320
170	6,336,784	6,343,929	107,478,803	120,159,516	0.0145	0.1465
180	14,062,257	9,766,672	44,562,712	68,391,641	0.0083	0.1548
190	16,899,609	10,363,019	69,747,960	97,010,588	0.0117	0.1665
200	18,245,758	9,640,655	52,369,300	80,255,713	0.0097	0.1762
210	21,070,820	12,416,352	76,073,469	109,560,641	0.0132	0.1895
220	18,428,133	12,194,608	41,804,583	72,427,325	0.0088	0.1982
230	12,841,984	8,027,727	24,417,641	45,287,352	0.0055	0.2037
240	11,954,912	8,532,316	8,904,447	29,391,675	0.0036	0.2073
250	13,875,170	7,737,857	6,134,428	27,747,455	0.0034	0.2106
260	10,489,159	9,158,492	6,285,849	25,933,500	0.0031	0.2137
270	11,904,599	11,851,753	0	23,756,352	0.0029	0.2166
280	15,450,819	12,268,561	10,692,995	38,412,375	0.0046	0.2213
290	29,357,770	19,593,296	0	48,951,066	0.0059	0.2272
300	30,497,032	24,838,953	0	55,335,985	0.0067	0.2339
310	28,599,146	26,757,384	0	55,356,530	0.0067	0.2406
320	27,271,335	19,423,091	0	46,694,426	0.0056	0.2462
330	25,352,254	19,662,882	0	45,015,136	0.0054	0.2516
340	30,539,563	23,542,946	0	54,082,510	0.0065	0.2582
350	40,873,685	31,269,117	0	72,142,802	0.0087	0.2669
360	44,429,160	29,471,400	0	73,900,560	0.0089	0.2758
370	66,923,583	28,757,543	0	95,681,126	0.0116	0.2874
380	61,680,536	41,467,299	0	103,147,835	0.0125	0.2999
390	70,387,073	49,272,995	0	119,660,067	0.0145	0.3143
400	113,508,200	61,653,887	0	175,162,088	0.0212	0.3355
410	142,898,190	79,526,196	0	222,424,386	0.0269	0.3624
420	199,746,037	103,368,457	0	303,114,494	0.0366	0.3990
430	290,136,957	168,199,668	0	458,336,624	0.0554	0.4545
440	303,864,590	255,039,136	0	558,903,726	0.0676	0.5220
450	326,475,086	270,211,699	0	596,686,786	0.0721	0.5941
460	291,626,206	281,052,123	0	572,678,329	0.0692	0.6634
470	250,299,048	234,531,916	0	484,830,964	0.0586	0.7220
480	171,083,587	184,078,178	0	355,161,765	0.0429	0.7649
490	128,909,995	137,113,451	0	266,023,446	0.0322	0.7971
500	88,088,402	103,211,102	0	191,299,504	0.0231	0.8202
510	94,043,705	86,058,806	0	180,102,511	0.0218	0.8420
520	55,688,388	54,550,219	0	110,238,607	0.0133	0.8553
530	73,892,666	49,459,072	0	123,351,738	0.0149	0.8702
540	49,116,315	46,871,147	0	95,987,463	0.0116	0.8818
550	72,325,666	50,779,257	0	123,104,922	0.0149	0.8967
560	49,996,093	42,157,412	0	92,153,505	0.0111	0.9078
570	56,987,125	51,960,114	0	108,947,239	0.0132	0.9210
580	45,606,380	45,184,586	0	90,790,966	0.0110	0.9320
590	35,737,935	47,813,059	0	83,550,994	0.0101	0.9421
600	30,625,211	33,071,937	0	63,697,148	0.0077	0.9498
610	26,832,384	40,552,121	0	67,384,505	0.0081	0.9579
620	21,039,823	24,815,364	0	45,855,186	0.0055	0.9635
630	23,423,676	30,903,315	0	54,326,991	0.0066	0.9700
640	13,929,122	21,838,961	0	35,768,083	0.0043	0.9744
650	15,097,598	23,572,457	0	38,670,055	0.0047	0.9790
660	10,172,269	18,762,742	0	28,935,011	0.0035	0.9825

Table E-1.--Continued.

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative Proportion
670	8,724,605	18,777,564	0	27,502,169	0.0033	0.9859
680	6,960,326	16,551,349	0	23,511,675	0.0028	0.9887
690	5,765,831	14,134,889	0	19,900,720	0.0024	0.9911
700	3,535,202	13,047,492	0	16,582,694	0.0020	0.9931
710	1,726,529	11,514,990	0	13,241,520	0.0016	0.9947
720	1,814,526	9,863,516	0	11,678,043	0.0014	0.9961
730	1,386,006	6,593,455	0	7,979,461	0.0010	0.9971
740	832,421	5,185,368	0	6,017,789	0.0007	0.9978
750	217,364	3,935,484	0	4,152,847	0.0005	0.9983
760	608,892	2,599,294	0	3,208,186	0.0004	0.9987
770	827,241	3,563,150	0	4,390,392	0.0005	0.9992
780	0	1,737,450	0	1,737,450	0.0002	0.9994
790	283,218	946,972	0	1,230,190	0.0001	0.9996
800	171,806	1,558,268	0	1,730,075	0.0002	0.9998
810	0	556,323	0	556,323	0.0001	0.9999
820	0	500,685	0	500,685	0.0001	0.9999
830	0	512,576	0	512,576	0.0001	1.0000
840	0	60,362	0	60,362	0.0000	1.0000
870	0	34,579	0	34,579	0.0000	1.0000
TOTAL	3,677,120,308	3,117,120,071	1,478,105,968	8,272,346,348		

Table E-2.--Population estimates by sex and size group for Pacific cod from the 1994 eastern Bering Sea bottom trawl survey.

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative Proportion
90	31,869	145,204	118,655	295,727	0.0002	0.0002
100	31,869	736,603	129,466	897,939	0.0007	0.0010
110	103,553	201,844	176,577	481,974	0.0004	0.0014
120	713,466	564,043	1,080,528	2,358,036	0.0019	0.0033
130	1,395,005	1,099,985	1,218,352	3,713,342	0.0030	0.0063
140	2,998,207	2,199,537	1,581,445	6,779,190	0.0055	0.0117
150	3,456,247	1,925,518	2,758,635	8,140,400	0.0066	0.0183
160	3,495,134	2,876,759	2,501,403	8,873,295	0.0072	0.0255
170	3,849,426	3,702,362	1,340,077	8,891,865	0.0072	0.0327
180	4,419,599	4,270,073	1,603,424	10,293,096	0.0083	0.0410
190	6,226,411	3,989,356	1,902,075	12,117,843	0.0098	0.0508
200	4,375,742	3,785,125	1,745,062	9,905,928	0.0080	0.0588
210	4,031,243	3,948,731	1,219,179	9,199,154	0.0074	0.0662
220	4,204,305	2,854,280	1,054,119	8,112,704	0.0066	0.0728
230	5,609,485	5,341,625	759,569	11,710,678	0.0095	0.0822
240	5,471,163	4,999,187	235,172	10,705,523	0.0086	0.0909
250	7,891,187	7,005,228	291,537	15,187,952	0.0123	0.1031
260	6,585,258	7,030,467	59,507	13,675,232	0.0110	0.1142
270	9,389,713	8,843,363	0	18,233,076	0.0147	0.1289
280	17,327,540	11,149,173	0	28,476,712	0.0230	0.1519
290	19,973,733	18,272,976	0	38,246,709	0.0309	0.1828
300	24,139,293	24,904,805	0	49,044,098	0.0396	0.2225
310	28,611,425	28,146,165	0	56,757,590	0.0459	0.2683
320	34,644,478	30,406,597	0	65,051,074	0.0526	0.3209
330	37,891,563	30,206,727	0	68,098,290	0.0550	0.3759
340	31,217,022	28,567,091	0	59,784,113	0.0483	0.4242
350	28,788,045	28,341,353	0	57,129,398	0.0462	0.4703
360	21,784,128	20,111,528	0	41,895,656	0.0338	0.5042
370	15,152,967	17,043,930	0	32,196,897	0.0260	0.5302
380	12,151,052	13,426,296	0	25,577,348	0.0207	0.5509
390	8,296,754	9,122,829	0	17,419,584	0.0141	0.5649
400	5,717,227	4,535,851	0	10,253,078	0.0083	0.5732
410	4,696,214	7,085,713	0	11,781,927	0.0095	0.5827
420	5,129,101	4,980,427	0	10,109,528	0.0082	0.5909
430	9,831,211	9,777,162	0	19,608,373	0.0158	0.6067
440	7,407,528	9,325,639	0	16,733,167	0.0135	0.6203
450	7,617,177	6,998,065	0	14,615,242	0.0118	0.6321
460	11,949,079	8,721,219	0	20,670,297	0.0167	0.6488
470	10,261,459	12,484,493	0	22,745,952	0.0184	0.6671
480	12,937,976	10,568,443	0	23,506,420	0.0190	0.6861
490	12,086,118	14,493,319	0	26,579,437	0.0215	0.7076
500	7,893,365	7,443,229	0	15,336,594	0.0124	0.7200
510	8,413,615	8,404,623	0	16,818,238	0.0136	0.7336
520	12,064,874	8,388,562	0	20,453,436	0.0165	0.7501
530	7,797,121	8,964,300	0	16,761,422	0.0135	0.7637
540	9,809,872	6,293,383	0	16,103,255	0.0130	0.7767
550	7,196,383	8,354,579	0	15,550,962	0.0126	0.7892
560	7,350,230	12,126,962	0	19,477,192	0.0157	0.8050
570	11,541,288	10,781,719	0	22,323,008	0.0180	0.8230
580	13,671,065	8,655,577	99,569	22,426,211	0.0181	0.8411
590	7,903,044	6,496,793	0	14,399,837	0.0116	0.8528
600	10,891,335	8,612,193	0	19,503,528	0.0158	0.8685
610	7,231,939	6,355,390	0	13,587,329	0.0110	0.8795
620	11,204,197	6,947,400	0	18,151,597	0.0147	0.8942
630	6,399,962	8,143,567	0	14,543,528	0.0117	0.9059
640	9,896,231	6,081,118	0	15,977,348	0.0129	0.9188
650	7,566,066	6,676,358	0	14,242,424	0.0115	0.9303
660	5,050,808	6,194,170	0	11,244,979	0.0091	0.9394
670	2,611,328	4,838,617	0	7,449,944	0.0060	0.9454
680	4,641,583	7,171,199	0	11,812,782	0.0095	0.9550
690	2,341,353	3,166,603	0	5,507,955	0.0044	0.9594
700	1,836,005	7,209,494	0	9,045,499	0.0073	0.9667

Table E-2.--Continued.

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative Proportion
710	1,508,491	2,815,025	0	4,323,516	0.0035	0.9702
720	3,202,327	2,757,918	0	5,960,245	0.0048	0.9750
730	1,074,471	1,582,410	0	2,656,881	0.0021	0.9772
740	950,616	2,654,036	0	3,604,652	0.0029	0.9801
750	1,069,205	685,615	0	1,754,819	0.0014	0.9815
760	1,144,199	1,475,002	0	2,619,201	0.0021	0.9836
770	495,570	676,575	0	1,172,144	0.0009	0.9846
780	1,142,502	745,059	0	1,887,560	0.0015	0.9861
790	392,085	381,632	0	773,717	0.0006	0.9867
800	471,891	317,697	0	789,588	0.0006	0.9874
810	380,197	540,487	0	920,683	0.0007	0.9881
820	285,972	804,751	0	1,090,723	0.0009	0.9890
830	316,598	137,495	0	454,093	0.0004	0.9894
840	276,827	522,436	0	799,263	0.0006	0.9900
850	286,255	429,601	0	715,857	0.0006	0.9906
860	369,458	437,864	0	807,322	0.0007	0.9912
870	141,079	444,788	0	585,868	0.0005	0.9917
880	160,987	179,135	0	340,122	0.0003	0.9920
890	187,400	353,437	0	540,838	0.0004	0.9924
900	98,324	2,964,399	0	3,062,724	0.0025	0.9949
910	874,965	299,283	0	1,174,248	0.0009	0.9958
920	487,758	325,379	0	813,138	0.0007	0.9965
930	0	234,460	0	234,460	0.0002	0.9967
940	0	44,660	0	44,660	0.0000	0.9967
950	215,508	74,563	0	290,072	0.0002	0.9970
960	0	560,427	0	560,427	0.0005	0.9974
970	73,279	261,896	0	335,176	0.0003	0.9977
980	108,892	27,855	0	136,747	0.0001	0.9978
990	0	64,604	0	64,604	0.0001	0.9978
1000	108,521	85,867	0	194,388	0.0002	0.9980
1010	93,899	744,580	0	838,480	0.0007	0.9987
1020	283,359	239,989	0	523,347	0.0004	0.9991
1030	42,693	241,789	0	284,482	0.0002	0.9993
1040	0	76,403	0	76,403	0.0001	0.9994
1050	0	620,815	0	620,815	0.0005	0.9999
1080	0	66,558	0	66,558	0.0001	0.9999
1100	0	69,551	0	69,551	0.0001	1.0000
TOTAL	621,444,963	596,438,968	19,874,350	1,237,758,281		

Table E-3.--Population estimates by sex and size group for yellowfin sole from the 1994 eastern Bering Sea bottom trawl survey.

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative Proportion
90	2,089,228	253,080	0	2,342,30	0.0002	0.0002
100	2,873,263	1,308,286	0	4,181,54	0.0004	0.0006
110	1,783,035	3,295,165	0	5,078,20	0.0005	0.0011
120	7,926,976	6,492,144	0	14,419,11	0.0013	0.0024
130	8,471,144	11,023,268	0	19,494,41	0.0018	0.0043
140	17,550,611	16,350,783	0	33,901,39	0.0032	0.0074
150	39,197,051	42,204,847	0	81,401,89	0.0076	0.0150
160	67,877,106	80,019,077	0	147,896,18	0.0138	0.0289
170	99,130,164	122,580,788	0	221,710,95	0.0207	0.0496
180	150,892,909	144,851,253	0	295,744,16	0.0276	0.0772
190	188,420,202	179,791,296	0	368,211,49	0.0344	0.1116
200	203,883,061	237,825,403	0	441,708,46	0.0413	0.1529
210	224,047,730	284,682,496	0	508,730,22	0.0475	0.2005
220	258,815,154	302,237,082	0	561,052,23	0.0524	0.2529
230	278,284,648	317,709,495	0	595,994,14	0.0557	0.3086
240	325,832,678	329,612,823	0	655,445,50	0.0613	0.3698
250	314,594,064	290,206,045	0	604,800,11	0.0565	0.4264
260	309,074,280	277,933,430	0	587,007,71	0.0549	0.4812
270	311,328,033	288,924,856	0	600,252,88	0.0561	0.5373
280	355,788,268	298,596,560	0	654,384,82	0.0612	0.5985
290	359,075,668	305,953,903	0	665,029,57	0.0622	0.6606
300	407,454,962	383,390,621	0	790,845,58	0.0739	0.7345
310	334,337,407	373,168,810	0	707,506,21	0.0661	0.8007
320	241,462,134	371,361,653	0	612,823,78	0.0573	0.8579
330	143,873,848	328,201,965	0	472,075,81	0.0441	0.9021
340	94,224,227	299,727,025	0	393,951,25	0.0368	0.9389
350	23,021,949	217,484,286	0	240,506,23	0.0225	0.9614
360	13,378,186	169,414,603	0	182,792,79	0.0171	0.9784
370	3,245,826	94,774,264	0	98,020,09	0.0092	0.9876
380	2,721,421	59,436,198	0	62,157,61	0.0058	0.9934
390	290,249	30,908,514	0	31,198,76	0.0029	0.9963
400	0	21,954,395	0	21,954,39	0.0021	0.9984
410	0	10,422,974	0	10,422,97	0.0010	0.9994
420	0	3,821,000	0	3,821,00	0.0004	0.9997
430	0	2,730,953	0	2,730,95	0.0003	1.0000
440	0	323,241	0	323,24	0.0000	1.0000
480	0	43,266	0	43,26	0.0000	1.0000
TOTAL	4,790,945,483	5,909,015,850	0	10,699,961,33		

Table E-4.--Population estimates by sex and size group for rock sole from the 1993 eastern Bering Sea bottom trawl survey.

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative Proportion
70	630,046	0	0	630,04	0.0000	0.0000
80	686,063	0	0	686,06	0.0000	0.0001
90	1,495,658	1,656,782	0	3,152,44	0.0002	0.0003
100	5,913,807	3,874,946	0	9,788,75	0.0006	0.0009
110	37,177,340	24,480,760	2,487,266	64,145,36	0.0041	0.0051
120	105,162,863	41,764,178	0	146,927,04	0.0095	0.0145
130	129,661,083	80,646,105	0	210,307,18	0.0135	0.0281
140	175,400,412	118,766,984	0	294,167,39	0.0189	0.0470
150	337,921,695	189,113,915	0	527,035,61	0.0339	0.0810
160	447,425,848	319,738,753	0	767,164,60	0.0494	0.1304
170	368,383,728	317,321,268	0	685,704,99	0.0442	0.1745
180	351,914,469	279,036,615	0	630,951,08	0.0406	0.2152
190	274,229,188	241,390,809	0	515,619,99	0.0332	0.2484
200	303,801,146	200,612,549	0	504,413,69	0.0325	0.2809
210	342,057,444	260,007,698	0	602,065,14	0.0388	0.3197
220	478,806,435	316,824,307	0	795,630,74	0.0512	0.3709
230	556,240,003	450,148,885	0	1,006,388,88	0.0648	0.4357
240	784,681,447	580,061,931	0	1,364,743,37	0.0879	0.5236
250	725,525,061	625,488,791	0	1,351,013,85	0.0870	0.6107
260	588,389,565	613,107,931	0	1,201,497,49	0.0774	0.6881
270	476,045,961	529,852,452	0	1,005,898,41	0.0648	0.7529
280	425,837,198	412,219,867	0	838,057,06	0.0540	0.8068
290	273,189,620	312,342,557	0	585,532,17	0.0377	0.8446
300	215,368,618	256,423,687	0	471,792,30	0.0304	0.8749
310	194,036,070	251,254,407	0	445,290,47	0.0287	0.9036
320	103,745,718	200,600,601	0	304,346,32	0.0196	0.9232
330	59,668,077	165,227,170	0	224,895,24	0.0145	0.9377
340	27,935,146	166,537,726	0	194,472,87	0.0125	0.9502
350	7,691,932	185,742,670	0	193,434,60	0.0125	0.9627
360	2,619,531	144,417,318	0	147,036,84	0.0095	0.9722
370	1,942,267	100,319,957	0	102,262,22	0.0066	0.9788
380	166,263	104,611,658	0	104,777,92	0.0067	0.9855
390	181,258	85,548,999	0	85,730,25	0.0055	0.9910
400	218,461	48,017,103	0	48,235,56	0.0031	0.9941
410	0	41,104,617	0	41,104,61	0.0026	0.9968
420	0	21,332,695	0	21,332,69	0.0014	0.9982
430	1,442,150	13,406,735	0	14,848,88	0.0010	0.9991
440	0	7,490,063	0	7,490,06	0.0005	0.9996
450	0	5,161,584	0	5,161,58	0.0003	0.9999
460	0	776,463	0	776,46	0.0001	1.0000
470	0	66,859	0	66,85	0.0000	1.0000
490	0	161,736	0	161,73	0.0000	1.0000
510	0	35,553	0	35,55	0.0000	1.0000
TOTAL	7,805,591,571	7,716,695,687	2,487,266	15,524,774,52		

Table E-5.--Population estimates by sex and size group for *Hippoglossoides* spp. from the 1994 eastern Bering Sea bottom trawl survey.

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative Proportion
80	836,298	0	0	836,298	0.0003	0.0003
90	51,681	413,779	176,439	641,899	0.0002	0.0006
100	1,380,343	1,072,872	172,965	2,626,180	0.0010	0.0016
110	3,588,013	1,232,971	704,374	5,525,357	0.0021	0.0037
120	7,599,401	4,815,316	562,763	12,977,479	0.0050	0.0087
130	12,497,825	8,475,525	347,006	21,320,356	0.0083	0.0170
140	19,034,419	14,029,439	858,797	33,922,655	0.0131	0.0301
150	24,412,610	17,934,403	446,307	42,793,320	0.0166	0.0467
160	27,343,542	24,737,386	624,398	52,705,326	0.0204	0.0671
170	38,433,950	22,360,860	1,070,397	61,865,207	0.0239	0.0910
180	44,131,705	33,069,952	356,799	77,558,456	0.0300	0.1210
190	43,612,258	33,550,936	267,599	77,430,793	0.0300	0.1510
200	40,351,378	27,036,349	89,200	67,476,927	0.0261	0.1771
210	35,376,490	29,137,277	178,400	64,692,166	0.0250	0.2021
220	32,515,833	25,471,824	535,199	58,522,855	0.0226	0.2248
230	35,981,095	21,945,655	624,398	58,551,147	0.0227	0.2475
240	38,825,353	34,763,507	535,199	74,124,059	0.0287	0.2761
250	54,066,220	39,901,048	802,798	94,770,066	0.0367	0.3128
260	65,105,697	47,144,311	713,598	112,963,606	0.0437	0.3565
270	61,778,293	50,130,339	802,798	112,711,430	0.0436	0.4001
280	67,574,780	58,170,773	713,598	126,459,152	0.0489	0.4491
290	75,086,662	59,908,478	713,598	135,708,738	0.0525	0.5016
300	78,006,491	62,819,781	267,599	141,093,871	0.0546	0.5562
310	79,116,224	62,745,402	89,200	141,950,826	0.0549	0.6111
320	75,198,839	63,551,625	89,200	138,839,663	0.0537	0.6649
330	78,494,277	49,297,661	267,599	128,059,537	0.0496	0.7144
340	70,004,316	55,201,769	178,400	125,384,485	0.0485	0.7629
350	74,314,752	41,509,049	89,200	115,913,000	0.0449	0.8078
360	57,505,544	43,813,111	0	101,318,655	0.0392	0.8470
370	37,901,620	34,054,383	0	71,956,003	0.0278	0.8748
380	23,568,488	39,201,349	89,200	62,859,037	0.0243	0.8992
390	8,139,545	39,738,611	0	47,878,156	0.0185	0.9177
400	5,272,306	40,715,669	89,200	46,077,174	0.0178	0.9355
410	1,772,334	33,408,895	0	35,181,229	0.0136	0.9491
420	1,324,291	29,054,766	0	30,379,056	0.0118	0.9609
430	283,335	32,293,618	0	32,576,952	0.0126	0.9735
440	105,305	19,186,774	0	19,292,079	0.0075	0.9810
450	0	19,459,247	0	19,459,247	0.0075	0.9885
460	0	13,957,387	0	13,957,387	0.0054	0.9939
470	0	7,216,466	0	7,216,466	0.0028	0.9967
480	0	4,477,538	0	4,477,538	0.0017	0.9984
490	0	1,485,237	0	1,485,237	0.0006	0.9990
500	0	1,404,356	0	1,404,356	0.0005	0.9995
510	0	697,311	0	697,311	0.0003	0.9998
520	0	73,772	0	73,772	0.0000	0.9998
530	0	244,093	0	244,093	0.0001	0.9999
630	0	155,088	0	155,088	0.0001	1.0000
TOTAL	1,320,591,510	1,251,065,956	12,456,226	2,584,113,692		

Table E-6.--Population estimates by sex and size group for Alaska plaice from the 1994 eastern Bering Sea bottom trawl survey.

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative Proportion
100	180,817	108,750	0	289,567	0.0003	0.0003
110	101,604	33,253	0	134,857	0.0001	0.0004
120	66,403	29,824	0	96,226	0.0001	0.0005
130	52,214	732,185	0	784,399	0.0008	0.0013
140	75,497	403,193	0	478,690	0.0005	0.0018
150	210,035	247,220	0	457,254	0.0005	0.0022
160	1,449,583	289,567	0	1,739,150	0.0017	0.0039
170	1,480,703	388,291	0	1,868,994	0.0018	0.0058
180	2,319,079	1,356,322	0	3,675,401	0.0036	0.0094
190	3,887,507	2,994,889	0	6,882,396	0.0068	0.0162
200	6,109,823	3,836,090	0	9,945,913	0.0098	0.0261
210	7,043,931	5,492,773	0	12,536,704	0.0124	0.0385
220	7,724,448	6,189,759	0	13,914,207	0.0138	0.0522
230	6,895,230	5,589,049	0	12,484,279	0.0123	0.0646
240	9,683,376	6,363,811	0	16,047,187	0.0159	0.0804
250	10,650,057	7,791,721	0	18,441,778	0.0182	0.0987
260	13,750,646	7,054,469	0	20,805,115	0.0206	0.1193
270	16,864,981	11,808,738	0	28,673,719	0.0284	0.1476
280	20,766,028	13,398,209	0	34,164,237	0.0338	0.1814
290	28,097,969	15,444,770	0	43,542,738	0.0431	0.2245
300	30,113,885	16,307,085	0	46,420,970	0.0459	0.2704
310	31,275,042	20,748,831	0	52,023,873	0.0515	0.3219
320	38,420,654	16,968,478	0	55,389,131	0.0548	0.3767
330	41,657,462	18,444,974	0	60,102,436	0.0594	0.4361
340	48,278,255	21,005,664	0	69,283,920	0.0685	0.5046
350	50,659,476	17,224,809	0	67,884,285	0.0671	0.5718
360	52,098,498	17,399,041	0	69,497,539	0.0687	0.6405
370	34,646,845	16,902,677	0	51,549,522	0.0510	0.6915
380	20,320,623	17,302,620	0	37,623,244	0.0372	0.7287
390	10,977,960	18,517,463	0	29,495,422	0.0292	0.7579
400	6,965,207	19,788,542	0	26,753,749	0.0265	0.7844
410	2,754,340	18,489,597	0	21,243,937	0.0210	0.8054
420	1,292,022	20,909,666	0	22,201,689	0.0220	0.8273
430	1,077,328	25,769,505	0	26,846,833	0.0266	0.8539
440	725,650	23,280,918	0	24,006,569	0.0237	0.8776
450	337,077	22,469,579	0	22,806,657	0.0226	0.9002
460	359,491	23,117,028	0	23,476,518	0.0232	0.9234
470	145,417	18,316,248	0	18,461,664	0.0183	0.9417
480	32,776	18,048,520	0	18,081,296	0.0179	0.9596
490	88,712	13,011,094	0	13,099,807	0.0130	0.9725
500	201,738	9,814,413	0	10,016,151	0.0099	0.9824
510	0	6,908,977	0	6,908,977	0.0068	0.9893
520	0	4,317,578	0	4,317,578	0.0043	0.9935
530	0	2,876,604	0	2,876,604	0.0028	0.9964
540	0	1,941,581	0	1,941,581	0.0019	0.9983
550	0	716,399	0	716,399	0.0007	0.9990
560	0	685,761	0	685,761	0.0007	0.9997
570	0	145,465	0	145,465	0.0001	0.9998
580	0	90,269	0	90,269	0.0001	0.9999
590	0	47,213	0	47,213	0.0000	1.0000
600	0	47,213	0	47,213	0.0000	1.0000
TOTAL	509,838,389	501,166,693	0	1,011,005,082		



Table E-7.--Population estimates by sex and size group for Greenland turbot from the 1994 eastern Bering Sea bottom trawl survey.

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative Proportion
120	0	0	29,691	29,691	0.0016	0.0016
180	40,691	0	40,691	81,381	0.0043	0.0058
190	40,691	0	0	40,691	0.0021	0.0080
210	0	54,252	0	54,252	0.0028	0.0108
250	54,252	0	0	54,252	0.0028	0.0136
300	115,365	0	0	115,365	0.0060	0.0197
310	253,657	30,556	0	284,213	0.0149	0.0346
320	193,394	108,505	0	301,899	0.0158	0.0504
330	162,992	90,895	0	253,887	0.0133	0.0637
340	30,556	122,301	0	152,858	0.0080	0.0717
350	30,556	60,423	0	90,979	0.0048	0.0765
360	50,028	220,675	0	270,703	0.0142	0.0907
370	225,496	63,615	0	289,111	0.0152	0.1058
380	140,015	122,558	0	262,573	0.0138	0.1196
390	367,137	142,592	0	509,730	0.0267	0.1463
400	205,195	82,784	0	287,979	0.0151	0.1614
410	513,821	223,428	0	737,248	0.0386	0.2000
420	274,405	89,039	0	363,443	0.0190	0.2191
430	552,104	173,101	0	725,205	0.0380	0.2571
440	881,164	365,040	0	1,246,204	0.0653	0.3224
450	672,659	328,617	0	1,001,276	0.0525	0.3748
460	216,694	258,794	0	475,487	0.0249	0.3997
470	467,230	275,753	0	742,983	0.0389	0.4387
480	607,706	230,201	0	837,907	0.0439	0.4826
490	263,638	498,094	0	761,732	0.0399	0.5225
500	431,254	147,588	0	578,842	0.0303	0.5528
510	460,337	86,060	0	546,397	0.0286	0.5815
520	132,075	91,621	0	223,695	0.0117	0.5932
530	138,669	28,616	0	167,285	0.0088	0.6020
540	0	82,550	0	82,550	0.0043	0.6063
550	40,691	57,700	0	98,390	0.0052	0.6114
560	89,363	30,556	0	119,919	0.0063	0.6177
570	127,594	61,112	0	188,706	0.0099	0.6276
580	31,807	108,669	0	140,476	0.0074	0.6350
590	28,532	171,244	0	199,776	0.0105	0.6454
600	0	142,076	0	142,076	0.0074	0.6529
610	0	30,556	0	30,556	0.0016	0.6545
620	0	108,505	0	108,505	0.0057	0.6602
630	106,019	74,212	0	180,231	0.0094	0.6696
650	0	47,571	0	47,571	0.0025	0.6721
660	0	18,402	0	18,402	0.0010	0.6731
670	59,172	123,559	0	182,730	0.0096	0.6827
680	163,838	28,616	0	192,453	0.0101	0.6927
690	86,561	0	0	86,561	0.0045	0.6973
700	147,905	227,584	0	375,490	0.0197	0.7170
710	40,691	40,691	0	81,381	0.0043	0.7212
720	0	302,006	0	302,006	0.0158	0.7370
730	0	54,252	0	54,252	0.0028	0.7399
740	0	144,005	0	144,005	0.0075	0.7474
750	31,807	98,390	0	130,198	0.0068	0.7543
760	0	102,380	0	102,380	0.0054	0.7596
770	0	213,092	0	213,092	0.0112	0.7708
780	19,511	225,309	0	244,820	0.0128	0.7836
790	0	307,189	0	307,189	0.0161	0.7997
800	31,807	268,462	0	300,269	0.0157	0.8155
810	0	354,217	0	354,217	0.0186	0.8340
820	0	296,439	0	296,439	0.0155	0.8495
830	0	178,586	0	178,586	0.0094	0.8589
840	0	281,606	0	281,606	0.0148	0.8737
850	19,511	232,020	0	251,531	0.0132	0.8868
860	0	497,888	0	497,888	0.0261	0.9129
870	0	60,511	0	60,511	0.0032	0.9161

Table E-7.--Continued.

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative Proportion
880	0	383,633	0	383,633	0.0201	0.9362
890	0	268,356	0	268,356	0.0141	0.9503
900	0	115,228	0	115,228	0.0060	0.9563
910	0	128,464	0	128,464	0.0067	0.9630
920	0	152,858	0	152,858	0.0080	0.9711
930	0	48,796	0	48,796	0.0026	0.9736
950	0	156,996	0	156,996	0.0082	0.9818
970	0	40,691	0	40,691	0.0021	0.9840
980	0	68,751	0	68,751	0.0036	0.9876
990	0	93,723	0	93,723	0.0049	0.9925
1000	0	114,938	0	114,938	0.0060	0.9985
1020	0	28,532	0	28,532	0.0015	1.0000
TOTAL	8,546,590	10,466,026	70,382	19,082,998		

Table E-8.--Population estimates by sex and size group for *Atheresthes* spp. from the 1994 eastern Bering Sea bottom trawl survey.

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative Proportion
60	0	49,416	0	49,416	0.0001	0.0001
80	0	51,159	0	51,159	0.0001	0.0001
90	64,997	0	0	64,997	0.0001	0.0002
100	176,413	0	0	176,413	0.0002	0.0004
110	304,174	38,655	0	342,828	0.0004	0.0008
120	264,697	273,863	0	538,560	0.0006	0.0014
130	728,733	463,579	0	1,192,312	0.0013	0.0027
140	189,137	918,843	35,772	1,143,752	0.0013	0.0040
150	1,970,287	2,586,508	0	4,556,794	0.0051	0.0091
160	5,959,430	7,251,649	153,211	13,364,290	0.0150	0.0242
170	6,465,061	9,564,078	112,378	16,141,518	0.0182	0.0423
180	6,514,522	10,377,413	0	16,891,935	0.0190	0.0613
190	4,395,915	8,336,589	0	12,732,504	0.0143	0.0757
200	4,735,514	7,662,034	76,606	12,474,154	0.0140	0.0897
210	3,221,589	5,215,187	0	8,436,776	0.0095	0.0992
220	4,094,643	5,706,870	0	9,801,514	0.0110	0.1102
230	2,527,901	6,128,051	0	8,655,952	0.0097	0.1200
240	9,338,416	10,598,761	0	19,937,177	0.0224	0.1424
250	6,953,877	9,480,920	0	16,434,797	0.0185	0.1609
260	8,305,101	11,733,519	0	20,038,620	0.0225	0.1834
270	6,555,384	9,710,104	0	16,265,488	0.0183	0.2017
280	9,374,508	11,607,812	0	20,982,320	0.0236	0.2253
290	8,268,125	7,863,255	0	16,131,380	0.0182	0.2435
300	7,312,800	11,998,502	0	19,311,302	0.0217	0.2652
310	8,028,254	12,775,602	0	20,803,855	0.0234	0.2886
320	8,546,502	11,993,244	0	20,539,746	0.0231	0.3117
330	9,392,124	14,348,116	0	23,740,240	0.0267	0.3385
340	8,961,635	13,505,329	0	22,466,964	0.0253	0.3637
350	8,097,375	13,872,333	0	21,969,708	0.0247	0.3885
360	10,743,635	15,898,650	0	26,642,285	0.0300	0.4184
370	9,301,084	16,348,775	0	25,649,859	0.0289	0.4473
380	13,203,629	18,877,689	0	32,081,318	0.0361	0.4834
390	14,015,945	16,919,188	0	30,935,133	0.0348	0.5182
400	14,004,569	23,107,424	0	37,111,993	0.0418	0.5600
410	14,935,842	25,689,464	0	40,625,306	0.0457	0.6057
420	14,858,669	22,151,273	0	37,009,942	0.0416	0.6473
430	9,686,195	22,908,167	0	32,594,362	0.0367	0.6840
440	8,095,539	26,253,062	0	34,348,601	0.0386	0.7226
450	8,632,088	22,842,078	0	31,474,166	0.0354	0.7581
460	5,705,120	17,963,485	0	23,668,605	0.0266	0.7847
470	5,284,350	16,779,974	0	22,064,324	0.0248	0.8095
480	3,508,395	17,742,248	0	21,250,643	0.0239	0.8334
490	3,296,075	13,901,478	0	17,197,553	0.0194	0.8528
500	1,775,901	13,608,087	0	15,383,988	0.0173	0.8701
510	1,961,077	15,404,106	0	17,365,184	0.0195	0.8896
520	1,282,159	14,306,796	0	15,588,956	0.0175	0.9072
530	1,809,453	11,443,328	0	13,252,781	0.0149	0.9221
540	1,188,911	10,989,188	0	12,178,099	0.0137	0.9358
550	708,069	7,707,606	0	8,415,675	0.0095	0.9452
560	259,506	7,695,189	0	7,954,695	0.0090	0.9542
570	440,810	5,876,727	0	6,317,537	0.0071	0.9613
580	334,751	7,479,827	0	7,814,578	0.0088	0.9701
590	604,161	6,290,211	0	6,894,372	0.0078	0.9779
600	0	6,138,217	0	6,138,217	0.0069	0.9848
610	170,573	2,762,032	0	2,932,605	0.0033	0.9881
620	623,527	3,815,817	0	4,439,343	0.0050	0.9931
630	0	1,638,315	0	1,638,315	0.0018	0.9949
640	0	1,408,356	0	1,408,356	0.0016	0.9965
650	59,092	810,462	0	869,554	0.0010	0.9975
660	0	367,572	0	367,572	0.0004	0.9979
670	0	448,406	0	448,406	0.0005	0.9984
680	0	274,061	0	274,061	0.0003	0.9987

Table E-8.--Continued.

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative Proportion
690	0	426,105	0	426,105	0.0005	0.9992
700	48,327	121,800	0	170,127	0.0002	0.9994
710	0	142,905	0	142,905	0.0002	0.9995
730	0	63,001	0	63,001	0.0001	0.9996
740	0	33,312	0	33,312	0.0000	0.9996
750	0	327,841	0	327,841	0.0004	1.0000
TOTAL	287,284,565	601,073,615	377,967	888,736,147		

Table E-9.--Population estimates by sex and size group for Pacific halibut from the 1994 eastern Bering Sea bottom trawl survey.

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative Proportion
110	0	0	30,869	30,869	0.0006	0.0006
190	0	0	31,855	31,855	0.0006	0.0013
200	0	0	29,070	29,070	0.0006	0.0019
210	0	0	130,942	130,942	0.0026	0.0045
220	0	0	33,482	33,482	0.0007	0.0052
230	0	0	163,685	163,685	0.0033	0.0085
240	0	0	194,885	194,885	0.0039	0.0124
250	0	0	258,734	258,734	0.0052	0.0176
260	0	0	267,325	267,325	0.0054	0.0230
270	0	0	126,656	126,656	0.0026	0.0256
280	0	0	33,482	33,482	0.0007	0.0263
290	0	0	33,204	33,204	0.0007	0.0269
300	0	0	61,738	61,738	0.0012	0.0282
310	0	0	64,856	64,856	0.0013	0.0295
320	0	0	33,204	33,204	0.0007	0.0302
330	0	0	59,466	59,466	0.0012	0.0314
340	0	0	57,594	57,594	0.0012	0.0325
350	0	0	131,210	131,210	0.0026	0.0352
360	0	0	133,633	133,633	0.0027	0.0379
370	0	0	130,661	130,661	0.0026	0.0405
380	0	0	203,976	203,976	0.0041	0.0446
390	0	0	312,707	312,707	0.0063	0.0510
400	0	0	175,737	175,737	0.0035	0.0545
410	0	0	302,314	302,314	0.0061	0.0606
420	0	0	297,634	297,634	0.0060	0.0666
430	0	0	468,068	468,068	0.0095	0.0761
440	0	0	883,837	883,837	0.0178	0.0939
450	0	0	794,266	794,266	0.0160	0.1100
460	0	0	1,421,553	1,421,553	0.0287	0.1387
470	0	0	1,154,039	1,154,039	0.0233	0.1620
480	0	0	1,115,039	1,115,039	0.0225	0.1845
490	0	0	941,528	941,528	0.0190	0.2035
500	0	0	975,118	975,118	0.0197	0.2232
510	0	0	950,200	950,200	0.0192	0.2424
520	0	0	1,068,559	1,068,559	0.0216	0.2639
530	0	0	895,065	895,065	0.0181	0.2820
540	0	0	1,886,926	1,886,926	0.0381	0.3201
550	0	0	1,305,411	1,305,411	0.0264	0.3465
560	0	0	1,298,604	1,298,604	0.0262	0.3727
570	0	0	1,447,406	1,447,406	0.0292	0.4019
580	0	0	1,438,142	1,438,142	0.0290	0.4310
590	0	0	1,861,918	1,861,918	0.0376	0.4686
600	0	0	1,895,633	1,895,633	0.0383	0.5069
610	0	0	1,701,689	1,701,689	0.0344	0.5412
620	0	0	2,184,215	2,184,215	0.0441	0.5853
630	0	0	1,757,252	1,757,252	0.0355	0.6208
640	0	0	1,669,978	1,669,978	0.0337	0.6545
650	0	0	1,825,628	1,825,628	0.0369	0.6914
660	0	0	1,667,672	1,667,672	0.0337	0.7251
670	0	0	1,002,852	1,002,852	0.0203	0.7453
680	0	0	1,024,040	1,024,040	0.0207	0.7660
690	0	0	1,339,944	1,339,944	0.0271	0.7931
700	0	0	1,174,044	1,174,044	0.0237	0.8168
710	0	0	767,364	767,364	0.0155	0.8323
720	0	0	910,270	910,270	0.0184	0.8506
730	0	0	617,777	617,777	0.0125	0.8631
740	0	0	572,317	572,317	0.0116	0.8747
750	0	0	542,688	542,688	0.0110	0.8856
760	0	0	283,341	283,341	0.0057	0.8914
770	0	0	352,504	352,504	0.0071	0.8985
780	0	0	333,719	333,719	0.0067	0.9052
790	0	0	307,138	307,138	0.0062	0.9114

Table E-9.--Continued.

Length (mm)	Males	Females	Unsexed	Total	Proportion	Cumulative Proportion
800	0	0	160,618	160,618	0.0032	0.9147
810	0	0	300,683	300,683	0.0061	0.9207
820	0	0	375,935	375,935	0.0076	0.9283
830	0	0	176,602	176,602	0.0036	0.9319
840	0	0	149,075	149,075	0.0030	0.9349
850	0	0	162,119	162,119	0.0033	0.9382
860	0	0	295,539	295,539	0.0060	0.9441
870	0	0	177,163	177,163	0.0036	0.9477
880	0	0	92,557	92,557	0.0019	0.9496
890	0	0	147,515	147,515	0.0030	0.9526
900	0	0	32,849	32,849	0.0007	0.9532
910	0	0	179,692	179,692	0.0036	0.9569
920	0	0	154,575	154,575	0.0031	0.9600
930	0	0	130,306	130,306	0.0026	0.9626
940	0	0	251,235	251,235	0.0051	0.9677
950	0	0	91,192	91,192	0.0018	0.9695
960	0	0	113,180	113,180	0.0023	0.9718
990	0	0	143,107	143,107	0.0029	0.9747
1000	0	0	31,809	31,809	0.0006	0.9753
1010	0	0	30,791	30,791	0.0006	0.9760
1050	0	0	51,863	51,863	0.0010	0.9770
1060	0	0	29,134	29,134	0.0006	0.9776
1070	0	0	83,327	83,327	0.0017	0.9793
1080	0	0	133,098	133,098	0.0027	0.9820
1090	0	0	33,352	33,352	0.0007	0.9826
1110	0	0	60,179	60,179	0.0012	0.9839
1140	0	0	17,498	17,498	0.0004	0.9842
1150	0	0	60,284	60,284	0.0012	0.9854
1160	0	0	17,498	17,498	0.0004	0.9858
1170	0	0	82,139	82,139	0.0017	0.9874
1180	0	0	72,953	72,953	0.0015	0.9889
1200	0	0	89,025	89,025	0.0018	0.9907
1210	0	0	31,049	31,049	0.0006	0.9913
1230	0	0	31,001	31,001	0.0006	0.9920
1240	0	0	47,366	47,366	0.0010	0.9929
1260	0	0	72,753	72,753	0.0015	0.9944
1270	0	0	59,742	59,742	0.0012	0.9956
1330	0	0	28,070	28,070	0.0006	0.9962
1340	0	0	59,212	59,212	0.0012	0.9974
1360	0	0	20,743	20,743	0.0004	0.9978
1370	0	0	52,288	52,288	0.0011	0.9988
1380	0	0	20,743	20,743	0.0004	0.9993
1470	0	0	17,254	17,254	0.0003	0.9996
1700	0	0	19,511	19,511	0.0004	1.0000
TOTAL	0	0	49,521,288	49,521,288		